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NOSOLOGIC POSITION OF ANXIETY NEUROSIS IN PSYCHIATRY

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In 1894 Freud published his paper on "The Justification for Detaching from Neurasthenia a Particular Syndrome: The Anxiety Neurosis."

In his original paper the symptoms of what he termed anxiety neurosis were listed as follows:

1. General irritability
2. Anxious expectation
3. Anxiety (not usually present in consciousness)
4. Awakening in fright (pavor nocturnus)
5. Nausea and biliousness, tendency to diarrhea
6. Paresthesias, atypical and changing, and even a tendency to hallucinations
7. Vertigo (*with or without anxiety*)
8. On the basis of chronic apprehensiveness (anxious expectation) on the one hand and a tendency to attacks of vertigo with anxiety on the other, two groups of phobias developed, the first related to common physiologic dangers (fears of snakes, thunderstorms, darkness, vermin); the second related to locomotion, agoraphobia, with all its accessory forms collectively characterized by their relation to movement

In addition, Freud listed rudimentary anxiety attacks and equivalents of an anxiety as follows:

(a) Attacks accompanied by disturbances of the heart action
(b) Attacks accompanied by disturbances of respiration
(c) Attacks of sweating
(d) Attacks of tremor and shuddering

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(e) Attacks of ravenous hunger
(f) Attacks of sudden diarrhea
(g) Attacks of locomotor vertigo
(h) Attacks of so-called congestion practically embracing all that had been called vasomotor neurasthenia
(i) Attacks of paresthesias

Having subtracted the symptomatology of anxiety neurosis from that of neurasthenia, as originally described by Beard, Freud left to neurasthenia the few following remaining symptoms: headache, spinal irritation, dyspepsia with flatulence and constipation. Both neurasthenia and anxiety neurosis constituted for Freud the group of true neurosis not amenable to psychotherapy.

In a previous paper I have discussed the nosologic position of neurasthenia in psychiatry and brought forward arguments in favor of the elimination of neurasthenia as a clinical entity in psychiatry.

In discussing the incidence and etiology of anxiety neurosis Freud mentioned the following situations, in the course of which this neurosis may develop:

(a) Virginal anxiety or anxiety in adolescents, and anxiety of the voluntarily abstinent male
(b) Anxiety in the newly married
(c) Anxiety in women whose husbands suffer from ejaculatio praecox
(d) Anxiety in women whose husbands practice coitus interruptus or reservatus, and in men practicing coitus interruptus
(e) Anxiety in women and men during frustrated sexual excitement
(f) Anxiety in widows and voluntarily abstinent persons, often found in typical combination with obsessional ideas
(g) Anxiety in the climacteric in both men and women during the last great increase of sexual need

We have no quarrel with the concept of the sexual origin for some cases of what Freud termed anxiety neurosis, provided we do not generalize it and apply it universally. There are indeed numerous cases in which the sexual factors do not play a part at all in the precipitation of an anxiety neurosis.

Though I will express at this point some of the conclusions of this paper, I feel that my doing so is justified for the clarity of the exposition.

It is my contention that under the general heading of anxiety neurosis Freud outlined in his *original* contribution not one but two

syndromes, the first a primary somatic syndrome, and the second a primary psychogenic one.

The first syndrome I should like to call "vegetative neurosis associated with anxiety," and the second, "anxiety neurosis proper."

I would likewise propose that both "vegetative neurosis associated with anxiety" and "anxiety neurosis proper" become subdivisions of a more general situation already termed by other authors "anxiety state."

Even though my contribution might seem from this brief introduction an already accepted viewpoint, I will endeavor to bring out the discrepancies and contradictions existing on this subject in the various textbooks of psychiatry. In addition, I will endeavor to clarify the concept of vegative neurosis associated with anxiety by emphasizing two different mechanisms of its production—the physiosomatic and the psychosomatic.

I will endeavor to establish close relationship between "vegetative neurosis associated with anxiety" and "anxiety neurosis proper," and, finally, I will endeavor to discuss the origin of anxiety in both clinical conditions.

Let us consider the mechanism of a vegetative neurosis associated with anxiety in the light of Freud's own concept of "sexual factors."

The act of coitus in its physical facets if prolonged and exhausting and not carried through to its ultimate consummation determines an excessive amount of excitation which may result in an overstimulation of the muscular system and of auxiliary vegetative organs and structures.

This repeated overexertion could result in a state of acute or chronic overexcitation, overstimulation, and overfunctioning of the heart and other organs, as well as of the vascular apparatus and its ramification in the various organs and in the peripheral and central nervous system.

Primary sexual stimuli unsatisfied because of social impediments, or suppressed sexual stimuli of individuals who had known the relaxation of gratification in the past, are other sources of excessive somatic stimulation which does not find its way into the ultimate channels of specific proper relief.

This nervous energy resulting from endogenous or exogenous stimuli, even though limited in the present discussion to the sexual sphere, represents, so to speak, a charge which, localized first to the organs of primary stimulation, sex organs, skin, mucosa of the mouth, or sensory specific organs, if unable to find its proper discharge, is dammed up,

and overstimulates the structures and organs, pathways, and end-organs, along which the normal discharge should have occurred.

In addition to this overcharge and overstimulation I wish to add that another phenomenon may take place, the phenomenon of "spreading" of the blocked nervous energy. The spreading of nervous stimuli because of an overflow to various segments and levels of the vegetative nervous structures and organs, is a characteristic reaction particularly of the autonomic nervous system.

The spreading of the nervous impulse in various vegetative pathways and organs may be facilitated by the concomitant hypersecretion of hormones from endocrine glands, and by the additional secretion in situ of adrenalin or acetylcholine, hormones which facilitate the stimulation and response of autonomic nervous endings at various levels.

As a result of this spreading of the autonomic nervous impulses different organs or different segments of organs are called into unusual activity, and their abnormal functioning is experienced and registered by the patients in terms of somatic sensations to which they are not accustomed in connection with normal vegetative functions.

It is only later that the patients, with the repetition of the abnormal sensations and the inability to find adequate medical explanations or relief, develop anxiety. Such an anxiety is therefore not the cause of the dysfunction but the consequence of it.

However, contrary to Freud's original concept not only sexual stimuli may result in an overstimulation and spreading of nervous energy. Other stimuli must be taken into consideration. Such stimuli may be endogenous as well as exogenous.

Among endogenous ones we might mention the possibility of primary somatic, functional or structural endocrine disturbances, the result of which may be the release of an excessive or deficient amount of stimulating hormones.

Other endogenous stimuli may be of physical nature. To appreciate their mechanism one must remember that the sensory visceral system in general and the blood vessels in particular respond to special stimuli such as distention, pressure, and tension. Therefore stimuli resulting from increased blood pressure in the vascular system and excessive distention in the gastrointestinal tract may determine vague sensations of discomfort and pain.

Chemical stimuli such as copious alcoholic libations especially if associated with heavy meals, as well as excessive secretion of gastric juice, may produce the same end results.

Furthermore, all stimuli, of hormonic chemical or physical nature,

resulting in excessive distention of the walls of the gastrointestinal or vascular systems, may lead to local destruction of cells, a destruction which may liberate excessive amounts of histamine. Histamine in turn stimulates visceral sensory fibers and determines abnormal vasodilation, congestion, and eventually punctuate hemorrhages, all reactions which may express themselves in terms of abnormal somatic sensations.

In addition to spreading of the nervous impulses into somatic structures, any excessive quantum of energy of somatic origin may activate an idea or a constellation of ideas as well as one or more affects present in the psyche at the time of its production.

This overstimulation of ideas and affects make them more prominent and more active in the field of consciousness. This excess of cathexis or energy charge may result in an overactivity of intellectual or affective mechanisms which, if pronounced enough, may ultimately increase or create a state of anxiety related to their meaning as well as to the inability of their adequate disposal.

I

The presentation of some of the somatic mechanisms capable of determining symptoms characteristic of a "vegetative neurosis associated with anxiety" has not taken into consideration another important mechanism responsible for the appearance of a vegetative neurosis, associated with anxiety, the psychogenic mechanism.

I am referring to the somatic manifestations accompanying normally (physiologically) any one of various affects, not only the sexual affect, but many others as rage, anger, hostility, resentment, fear, all carrying with them somatic accompanying manifestations some of which have been established experimentally.

Thus we are all familiar with Cannon's findings concerning rage and anger.

We are also familiar with Wolff's reports concerning the influence of various types of conscious emotions on biologic disturbances of the gastric mucosa.

If these conscious emotional states are strong enough or if they are elicited frequently enough, acute or chronic fundamental changes and ultimately even structural changes may occur in various vegetative organs the result of which will be perceived by the patient as abnormal somatic sensations. It is easily conceivable that the resulting acute or chronic attacks of vegetative dysfunction such as outbursts of tachycardia, gastrointestinal dysfunction, dyspnea, perspiration, etc., may gradually induce marked anxiety, related to the meaning of the attacks and to the disposal of the excessive somatic stimuli.

A further psychogenic mechanism of production of anxiety may also be the one related to the presence of primary overactive mental activity. There are individuals endowed constitutionally with an overactive mental organization. Ideas or constellations of ideas are in a state of continuous "charge" by a quantum of energy in excess of the average.

If this primary energy charge of simultaneous ideas has no way of being relieved because of conflicting goals or multiplicity of goals, one may postulate that this situation may be experienced by the individual as a state of tension and discomfort. The excessive or accumulated nervous energy finding its way blocked in the way of satisfactory mental relief may spread into somatic structures along which the discharge of tension is effected. Thus abnormal somatic sensations may set in and anxiety may ultimately develop.

We have thus met with two groups of "vegetative neurosis associated with anxiety": (a) the primary somatic one, in which the primary stimuli are of somatic origin, and (b) the group in which the primary stimuli are of a psychogenic nature.

In the first group I postulate a mechanism of accumulation and spreading of nervous impulses resulting from primary somatic stimuli. The spreading is governed by the fundamental physiologic laws which govern the spreading or diffusion of nerve impulses in the cerebrospinal but particularly in the autonomic nervous system.

In the second group the physiopathology is less well known. The development of the ultimate neurosis depends mainly on the laws which govern the psychosomatic interrelationship, the laws which establish the concomitance of emotions and accompanying vegetative manifestations.

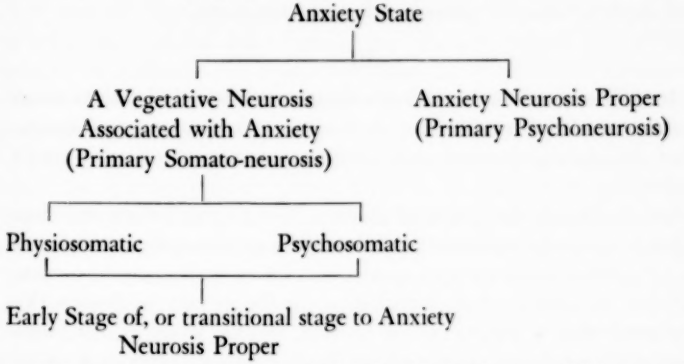
If we wished to be more specific in the designation of the "vegetative neurosis associated with anxiety," we could call the neurosis of the first group of primary somatic origin "physiosomatic," because of the primacy of the physiologic disturbance, whereas the vegetative neurosis of the second group could be called "psychosomatic" because of the primacy of the psychogenic disturbance.

Because a vegetative neurosis may exist unassociated with anxiety, the vegetative neurosis which I am discussing in connection with anxiety neurosis *must* be qualified by the additional wording "associated with anxiety."

Failing to add this qualification, a simple vegetative neurosis does not belong to the field of psychiatry but to the field of neurology, endocrinology, or internal medicine.

With this understanding I propose that the entire clinical picture of anxiety neurosis as originally described by Freud be known as "anx-

iety state." The anxiety state should, in turn, be subdivided into "vegetative neurosis associated with anxiety," a primary somato-neurosis, and "anxiety neurosis proper," a primary psychoneurosis.


Anxiety State
A Vegetative Neurosis Associated with Anxiety (Primary Somato-neurosis)
Anxiety Neurosis Proper (Primary Psychoneurosis)
Physiosomatic
Psychosomatic
Early Stage of, or transitional stage to Anxiety Neurosis Proper

The vegetative neurosis associated with anxiety would in turn be of physiosomatic or psychosomatic origin.

In the physiosomatic group the anxiety follows primary somatic stimuli. In the psychosomatic group the anxiety follows somatic manifestations also, but these are originally activated by conscious phychogenic processes and represent the accompanying manifestation of various affects. The vegetative neurosis associated with anxiety could be considered as an early stage of, or transitional stage to anxiety neurosis proper.

II

Let us now discuss the anxiety neurosis proper.

We will first consider some of the etiologic factors mentioned by Freud in the description of his original "anxiety neurosis."

In discussing the virginal anxiety or anxiety of adolescents one can speculate, contrary to Freud, that the anxiety which develops in maturing girls by their first meeting with the sexual problem may be suppressed or repressed because of a sense of guilt or because of fears related to a rigid moral upbringing. The mechanism of repression is a psychogenic one, intrinsically related to psychodynamics.

The same considerations apply to what Freud terms the anxiety in widows and the sexual temptations of individuals belonging to religious orders, harnessed as they are by the vow of chastity.

However, as I have already stated not only the sexual affect but other affects may play a part in the precipitation of the neurosis. These affects may be a feeling of inadequacy, a feeling of guilt, a feeling of

repressed hostility, a feeling of rejection, all of which through psychogenic unconsciousness mechanisms of simple or complex transposition or substitution may determine ultimately an "anxiety neurosis proper" even in the absence of unhealthful sexual situations.

III

Freud's original description of anxiety neurosis included the various phobias which he felt "develop as a result of a chronic apprehensiveness(anxious expectation) and a tendency to attacks of vertigo with anxiety."

In considering the origin of phobias, Freud (1894) discussed them together with the obsessions. He stated that "two components were found in every obsession: (1) an idea that forces itself upon the patient, and (2) an associated emotional state. In the groups of phobias this emotional state is always one of 'morbid anxiety' while in true obsessions other emotional states such as doubt, remorse, anger, may occur in the same capacity as fear does in phobias."

In addition, Freud felt that in obsessions the emotional state persists continually and that the associated idea is no longer the appropriate original one but is one which replaces it, as a substitute for it.

In phobias, on the other hand, substitution is not for Freud the predominant feature; psychologic analysis revealed no intolerable replaced idea in them.

Thus Freud attempted as early as 1893-94 to establish a clear-cut distinction between phobias and obsessive ideas, but in his writings one senses the difficulty he experienced from the first in keeping such a distinction valid. For example, while he had just stated that in phobias substitution was not the predominant feature, and that psychologic analysis revealed no intolerable replaced idea, he discussed the dislocation or transposition of affect in phobias in the following words: "Any idea which is either suited by nature to be associated with an affect of this quality or else bears a certain relation to the unbearable idea, in consequence of which it appears practicable to employ it as a *surrogate* (substitute?) for the latter, may be made use of, in secondary connection with the detached affect."

Furthermore, in speaking of therapy in terms of a retranslation, Freud expressed himself as follows: "I have turned experience of this kind to therapeutic advantage by redirecting the attention of patients with *phobias* and *obsessions,* in spite of all their protestations, back to the *repressed* sexual ideas." Thus in both phobias and obsessions Freud spoke of "*repressed* sexual ideas," and in both phobias and obsessions he found psychotherapy beneficial.

Yet with this material at his disposal as early as 1894, Freud did

not hesitate to include the phobias in the clinical picture of anxiety neurosis, an actual neurosis which he did not consider amenable to psychotherapy.

It was not until 1909 that Freud, discussing the case of a phobia in a five-year-old boy, Hans, introduced the new concept of "anxiety hysteria" to define certain types of phobias—the phobia of little Hans—that a white horse would bite him, which developed on the basis of a previous agoraphobia.

Freud did not seem clear as to the extent of anxiety hysteria. Though when he first mentioned anxiety hysteria he seemed to apply that definition only to the phobias proper, later in the same paper he spoke of anxiety hysteria as something different, because, in his own words, "anxiety hysteria tends to develop more and more into a phobia."

However, even if one were to accept Freud's concept of anxiety hysteria as limited to the formation of certain phobias, the fact remains that we have no indication from Freud himself as to the possible classification and ultimate division of the phobias. Are all the phobias expression of anxiety hysteria? Does he consider phobias definitely extraneous to the clinical picture of anxiety neurosis?

In a sentence included in his first description of the anxiety neuroses Freud stated that there are examples of "pure hysterical phobias," thus implying that in 1895 he was already aware of phobias depending on hysterical mechanisms. He nonetheless described all sorts of phobias as an integral part of his original clinical picture of anxiety neurosis.

I have failed to find in Freud's writings any attempt at reformulation of his original clinical description of anxiety neuroses. Freud's failure to clarify the relationship of phobias to anxiety neurosis has resulted in what seems to be a marked confusion in connection with the extent of the syndromes of anxiety neurosis and anxiety hysteria and their nosologic position in psychiatry. Such a failure justifies Strecker, Ebaugh, and Ewalt's recent statement (1951) that there is no complete agreement as to what is to be included under the designation of "anxiety hysteria," and that some workers do not use it at all.

To exemplify such a confusion I will limit mystelf to a few quotations related to contradictory statements and confusion which are carried in many textbooks, to the evident disadvantage of both student and teacher.

In 1935, W. White, in his *Outlines of Psychiatry* included the phobias as part and parcel of the symptomatology of anxiety neurosis.

In 1948, in his textbook of psychiatry Noyes classified the phobias under the heading of compulsion neurosis. In addition he advocated the discontinuation of the term anxiety hysteria.

Weiss and English in their text on psychosomatic medicine (1949)

did not even describe "anxiety neurosis" as a clinical entity and they seemed to have entirely substituted this syndrome for that of "anxiety hysteria" in connection with which they describe the various fears and phobias.

Bosselman (1950) separated the anxiety state from the anxiety hysteria which he described as "the phobic state."

Hinsie and Shatzky (1947) defined anxiety hysteria as simply hysteria associated with preponderant anxiety. They defined phobia simply as a morbid fear associated with morbid anxiety and mentioned the hypochondriacal phobias, the hysterical phobias, and the traumatic phobias.

Henderson and Gillespie in their text on psychiatry (1950) spoke of "anxiety states" under which they included the two principal varieties of "anxiety neurosis" and "anxiety hysteria." They felt that the first variety is unusual in pure form and that the vast majority of cases on closer examination will be found to belong to the second group. On the other hand, they considered the term "anxiety hysteria" confusing and incorrect, even on Freud's own showing.

In the official classification published in 1942 by the American Medical Association under the name of Standard Nomenclature of Disease and of Operation, anxiety hysteria and anxiety neurosis were separately classified under the heading of neurosis. Yet the phobias were described separately from anxiety hysteria and anxiety state under a subheading of "psychasthenic states."

R. Brun in his *General Theory of Neurosis* (English translation, 1951) included anxiety neurosis and "neurasthenia" under the heading of "vegetative neurosis." The phobias were described as a variety of hysteria (anxiety hysteria).

Faced, however, with the difficult problem of discussing the phobias as a symptom of anxiety neurosis, Brun resorted to the ingenious, though hardly convincing, suggestion of dividing the phobias into genuine phobias to be found in anxiety hysteria, and pseudophobias to be found in anxiety neuroses.

In genuine phobias the imaginary situation of danger is merely a symbol, a substitute, whereas in pseudophobia the anxiety has an object but the anxiety itself has no meaning, no psychologic content. It is a purely primary feeling.

Brun, however, fails to mention the rules governing such a distinction.

Brun's concept that in the pseudophobias the anxiety has a definite object contradicts somewhat Freud's own views that the fear of an actual perceptual external object is outstanding in the real phobias.

This is not the place to discuss Freud's own views that a phobia differs from an obsession because in phobias it is an external object which determines anxiety and that the determinant of anxiety is the fear of castration, whereas in obsession there is no trace of projection, the danger being completely internalized and the determinant of anxiety is the fear of the super-ego.

Our knowledge of the phobias and of their varieties or different significance is presumably too scanty. This lack of knowledge applies especially to the mild phobias expressed in terms of apprehension and anxiety about a number of factors, internal or external.

In practice, few cases of anxiety neurosis are encountered in which one does not find the presence of either moderate or pronounced fears directed toward, or bound with different situations or objects.

In view of the fundamental combination of vegetative disturbances, anxiety, and phobias in the anxiety state, and in view of the rarity of isolated phobias deprived of the remaining clinical symptoms of anxiety neurosis, I feel that phobias should remain an integral part of the "anxiety neurosis proper" and that the vague and indefinite concept of anxiety hysteria should be abandoned.

The elimination of anxiety hysteria and the division of anxiety state in the "vegetative neurosis associated with anxiety" and anxiety neurosis proper has another advantage—that of considering the "vegetative neurosis associated with anxiety" as an early stage of or a transitional stage toward a developing "anxiety neurosis proper."

The gradual passage from a vegetative neurosis associated with anxiety in which anxiety may be free-floating, to an anxiety neurosis proper in which the anxiety binds itself to objects or to an ideational content to create phobias, is a more understandable process and need not call into action hysteria in which "conversion" in the motor and sensory systems and the lack of conscious anxiety, *la belle indifference,* have always been outstanding characteristics.

IV

The identical origin of anxiety in both "vegetative neurosis associated with anxiety" and "anxiety neurosis proper" is another argument in favor of the close relationship of these two syndromes.

I will endeavor to develop this last point.

We are all familiar with Freud's original conception that the libido or cathectic energy of a repressed impulse was automatically transformed into anxiety. We are also familiar with his rejection of this concept and with his revised views published in 1926 in his monograph on inhibition symptoms and anxiety.

In his revised concept, Freud states that anxiety is an affective state and as such can of course be felt only by the ego. The id cannot have anxiety as the ego can, for it is not an organization and cannot make a judgment about a situation of danger. On the other hand, it often happens that processes take place or begin to take place in the id which cause the ego to produce anxiety.

Freud feels that situations analogous to the trauma of birth may be established in the id and that an automatic new reaction of anxiety ensues. This type of automatic anxiety is operative in the etiology of what he termed the actual neuroses.

On the other hand, situations may occur in the id which activate a danger situation for the ego and induce the latter to give the anxiety signal for inhibition or repression to take place. This situation is operative in the psychoneurosis.

The difference which Freud tries to establish between the origin of anxiety in the actual neuroses and the origin of anxiety in the psychoneurosis is enhanced by his following considerations.

In the actual neuroses, in the presence of excessive tensions due to need, the ego finds itself in a state of helplessness. This state of helplessness is reminiscent of the act of birth when an economic upheaval takes place, a first situation of danger. Following this first type of anxiety, whenever excessive somatic tensions due to need take place in the ego, an *automatic* new anxiety develops on the pattern of the anxiety of birth.

On the other hand, in the psychoneuroses he feels that it is the danger situation which is utilized by the ego intentionally to determine anxiety and that this anxiety is utilized by the ego to activate repression. In psychoneuroses the anxiety is *intentional,* always precedes repression, and does not develop automatically as in the actual neuroses. It is not newly created, and it is reproduced as an affective state on the model of an already existing memory picture.

In my estimation, the weak points in Freud's construction are the following: (a) excluding the id from feeling anxiety, (b) division of anxiety into an "automatic" and "intentional" one. The first point is not as important as the second one.

Concerning the exclusion of the id from feeling anxiety, one might rightly question the extent to which the id may possess some of the attributes of the ego. After all, the ego develops from the id and the basic elements which later on enter into the constitution of the ego are already present in the id at birth. The elements and the qualities which the id possesses in common with the fully organized ego have never been established, and it is only an assumption that the id does not feel

anxiety. If this were the case, could we satisfactorily explain how anxiety, if any is felt in the intrauterine life, or at birth or in the neonatal period?

When a situation of danger occurs in the id—and Freud accepts this occurrence—and when anxiety develops automatically, it may be conceivable that some of the formative elements of the ego rooted within the id may be capable, per se, of sensing anxiety in a primitive sort of way on the basis of primeval pre-individual memory patterns of reaction to danger. Freud himself states that "affective states have become incorporated in the mind as precipitates of primeval, perhaps even pre-individual experiences, and that anxiety has an indispensable biological function to a state of danger." This feeling of anxiety on the part of the id could be viewed as embryonic, global, or "protopathic."

The ego, on the other hand, definitely feels anxiety in the presence of a situation of danger, but the anxiety need not necessarily originate through an "intentional" mechanism. It may also be automatic and patterned along the situation of birth, along other experiences of the individual life, as well as along pre-individual experiences. When patterned along individual experiences it could be a sort of conditioned reaction.

The ego anxiety when conditioned or patterned through previous experiences of the individual life would display more discriminative tendencies because of its connection with more recent memory patterns and could be viewed as more apt to be utilized in "epicritic" fashion.

If we agree that anxiety is automatically determined in both the id and the ego, we can dispense with the division of automatic and intentional anxiety as characterizing two supposedly different clinical situations.

If anxiety is an affect incorporated in the mind as a precipitate of primeval, perhaps even pre-individual, experiences, and is a reproduction of an already existing memory picture in the form of memory symbols, nothing should prevent us from formulating the concept that whenever a situation of danger occurs in the id or in the ego, anxiety always develops automatically following the pattern of pre-individual or individual experiences.

Once anxiety has developed even in a form which may be considered inexpedient and purely biologic, this affect may then be utilized by the developed ego which judges the source and intensity of the danger, in order to elicit and determine its most appropriate expedient usage. In other words, an automatic inexpedient anxiety, irrespective of its source, may be utilized by the ego for the more effective expedient process of defense.

By accepting a universal automatic production of anxiety, we eliminate the necessity of accepting the more complicated and obscure mechanism for the creation of "intentional" anxiety in the psychoneuroses as a signal of danger to set in repression, as advocated by Freud.

Indeed, what is the source of the energy which is employed by the ego intentionally to create anxiety?

Here Freud resorts to the following explanation: The ego withdraws its (preconscious) cathexis from the psychic representative of the impulse that is to be repressed and uses that cathexis for the purpose of releasing anxiety.

How are we to define this process of withdrawal of cathexis? Is it the first step of repression? It could be so if such a step is an integral one in the activitation of repression. The inclusion of the process of withdrawal of energy as a part of the process of "repression" itself seems implied in Freud's own words. "Of course there is nothing to be said against the idea that it is precisely the energy that has been liberated by being withdrawn *through repression* which is used by the ego to arouse affect."

On the basis of this wording, it is this first step of repression which produces anxiety and not anxiety which determines repression.

If, on the other hand, we were to accept the concept that the moment a situation of danger is determined or sensed within the id or by the ego, automatic generation of anxiety follows, and that this anxiety would set in motion the machinery of repression, such a concept would harmonize with Freud's views that anxiety precedes repression.

The concept of "automatic" anxiety would also eliminate the necessity of explaining the contradictory statement of Freud that in the face of danger there is a withdrawal of energy from the intolerable idea of danger. Withdrawal of energy from the perception of danger might harmonize with one of the mechanisms of defense against the danger, and formation of symptoms, the one of flight. But there are other ways of interpreting symptoms, and other ways of interpreting defense, particularly the one of fight in which the ego participates. In this case rather than withdrawing cathexis from the perception of the dangerous object, additional energy is invested in the perception of every move of the dangerous object in order to fight successfully.

The concept of anxiety being automatically determined and patterned on pre-individual experiences on the anxiety of birth, or on previous individual experiences as a conditioned reaction would be more in harmony with Freud's own conception of anxiety being determined by an increase in excitation, internal or external, which, on the one hand, produces the quality of unpleasure, and, on the other, finds relief

through particular channels of discharge. The determinant of anxiety in a situation of danger will be, as a rule, an increase in external or internal stimuli related to a situation of danger, irrespective of how the ego may dispose of the anxiety.

Once anxiety has been created the ego may find itself helpless to negotiate or to master its presence. The anxiety may remain, so to speak, in a floating state because of the unpreparedness, inability, or perhaps even an unwillingness of the ego to resort to any mechanism of defense.

If, however, the unpleasurable feeling of anxiety and its discharge along vegetative channels determines a situation of unpleasure which the ego can avoid, and wishes to avoid, then mechanisms of defense are set up, transposition of affect takes place, and binding of the floating energy of anxiety to some specific object or ideational content gradually may take place.

Such is the mechanism of the gradual development of a "vegetative neurosis associated with anxiety" into an "anxiety neurosis proper" in which phobias are outstanding.

Conclusions

Clarification concerning the nosologic position of anxiety neurosis in psychiatry could be summarized as follows:

1. The original nomenclature of "anxiety neurosis" as described by Freud should be replaced by the term "anxiety state" with two subdivisions—vegetative neurosis associated with anxiety, and anxiety neurosis proper.

2. The vegetative neurosis associated with anxiety (primary somatoneurosis) would include a group of cases in which a primary somatic origin of the symptoms is presumed, this group to be qualified as physiosomatic, and a second group in which primary acute or chronic psychogenic conscious factors are presumed, this group to be qualified as psychosomatic.

3. "Anxiety neurosis proper," a psychoneurosis, constitutes a syndrome in which anxiety not only is present but already attached to objects or to ideational contents, as a result of which phobias are determined.

4. The inclusion of phobias under the heading of anxiety neurosis proper would justify the elimination of "anxiety hysteria," the clinical description of which has been built up only by inference but never decisively outlined in psychiatric nosology.

5. The great clinical similarities between a "vegetative neurosis associated with anxiety" and "anxiety neurosis proper," a psychoneurosis, the rarity of pure cases of "vegetative neurosis associated with

anxiety," and the large number of transitional cases between the two conditions lead to the suggestion that the whole clinical picture of anxiety states be classified under the heading of psychoneurosis.

6. The vegetative neurosis associated with anxiety could represent an early stage of, or a transitional stage toward anxiety neurosis proper.

7. The origin of anxiety may be considered identical in both the so-called actual neurosis of Freud and the psychoneurosis. It may be automatically elicited along the conditioned pattern of previous individual, or even pre-individual experiences, and may be at first inexpedient. It is the ego which later on utilizes the anxiety for a more expedient purpose in the process of defense.

8. In view of my previous suggestion that neurasthenia be dropped from the psychiatric nosology, and in view of the suggestion that the whole clinical picture of the anxiety state be considered as a psychoneurosis, the concept of Freud's "actual neurosis," which originally included neurasthenia and anxiety neurosis, has outlived its usefulness and should be eliminated from the psychiatric nosology.

A CASE OF FULMINATING PYROMANIA*

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Acute emotional catastrophes are not an uncommon occurrence in psychiatry. One notes the acutely excited catatonic whom it takes a half-dozen husky attendants to subdue; the raving paretic in the terminal death throes of the disease when even therapeutic restraint is not fully effective; the involutional melancholiac desperately set on committing suicide; the cases of acute homosexual panic wherein the man may decimate a whole family or more; and many others. But one never hears of such reactions in neuroses where the most usual occurrence is a high temper tantrum; nevertheless, acute emotional catastrophes do occur in neuroses and the case to be described herewith is presented as a demonstration.

Stekel (Stekel, W.: *Peculiarities of Behavior. Cleptomania and Pyromania.* New York: Boni & Liveright, 1924.) gave a most excellent review of the subject of pyromania 30 years ago. Sufficient material has accumulated since then to make another review desirable, but it wasn't until recently that Lewis and Yarnell (Lewis, N. D. C., and Yarnell, H.: *Pathological Fire-Setting.* Monograph No. 82. New York: Nervous and Mental Disease Monograph Publishing Co., 1951.) published their most excellent monograph giving us a most comprehensive review of the subject. Because of limitations of space, a study of the patient's dream life will be presented on a later occasion.

This case concerns a 30-year-old white male, a veteran of the first World War, who was committed to St. Elizabeths Hospital after being subject.

Background.—The heredity is essentially negative. His father left home when the patient was less than three years old, and is supposed to have drowned himself because of worry over financial reverses, although there appears to have been some doubt in connection with the identification of his body. The mother appears to have been of a hysterical make-up, given to unnecessary worry, and once attempted suicide following her disappointment after she had been led to believe, on very questionable evidence, that her husband was still alive and would return home. The patient is the next to the youngest of 10 children. His account of his siblings is meager, but there is nothing to indicate

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the presence in any of them of an abnormal trend, and all of them made average economic adjustments. One older brother, however, committed suicide in middle age.

The family lived in the country until the patient was seven years old, when they moved to the city where the two oldest children had obtained employment. Patient claims that there was seldom a quarrel in the family and that all the children got along well together.

He was breast-fed, weaned rather late, had the usual childhood diseases. He was hospitalized for influenza during the war, and there is a history of four attacks of malaria covering periods of from one week to more than two months. While he has had several accidents, none of them was serious.

He completed the first semester of high school at the age of 15, when he enlisted in the Army, with his mother's reluctant consent. He was confirmed in the Catholic Church, but never had any real religious interest. Various members of the family belonged to different churches, and there was no oppressive religious atmosphere in the home.

There are far fewer early neurotic indications than we might expect. There was no enuresis after the age of four. He was very restless as a child. He recalls only one instance of an early nightmare, the content of which he cannot remember. He does remember vividly one incident which was in the nature of an illusion, but which may have been preceded by a forgotten dream, when "I thought I saw the devil with huge horns . . . crawling along the floor toward me." It developed that he had seen the family cat carrying a mouse. He did not walk or talk in his sleep. At the age of ten he developed fits of temper, when "I would fly off the handle at the least thing, and pick up anything that I could reach and throw it at the first person who came near me." At the age of 13, there was a period of nervousness, with nail-biting.

He received no sex instruction at home. An older boy told him and three of his companions the true facts of childbirth. When he was a little more than eight years old, a boy of twelve initiated him and a group of other boys in masturbation, and he subsequently practiced this almost daily. He was sexually precocious, and "was always trying to see women while they were in the bathroom or while they were taking their clothes off." In the company of other boys, he would make voyeuristic excursions through alleys, which usually terminated in masturbation. He had his first heterosexual experience at the age of 12 with a colored girl, in the company of another boy. He admits having had thoughts of asking one of his sisters—it didn't matter which one—to let him have intercourse with her, but was afraid of being disgraced in the family circle. He was sexually attracted toward an aunt who,

when he was 14, seduced him, after which "I went to her house and had relations with her on an average of twice a week." This relationship lasted until he enlisted in the Army.

Army Period.—Patient was in the Army for five years; was first on the Mexican Border and afterward in France where he was in nine major engagements, but was never wounded. Following his discharge he held a number of positions, many of which were with decorating or construction firms. While he seems to have done acceptable work, his occupational adjustment was poor because of increasing neurotic interference. He began to use alcohol after he entered the Army, and there is a history of one episode of alcoholic delirium, but for the most part his drinking was spasmodic. A number of his later antisocial activities were preceded by alcoholic indulgence.

In the meantime he had met Beatrice, with whom he fell madly in love, and whom he "placed on a pedestal out of reach of anything earthly, like an angel." He claims that he never had any physical intimacies with her. They were engaged to be married. The marked contrast between his attitude toward Beatrice and his sexual promiscuity where other women were concerned constitutes one of the outstanding features of his case.

While in the Army he paid his first visit to a house of prostitution, and soon became a habitual visitor at such houses. He says that "there was a thought at times of its being a betrayal, but at the same time nature seemed to have too much influence in this matter." Beatrice came to visit him and remained for two months at a hotel near the Army post. He says that those two months were the happiest of his life. He professes to have no desire during that period to go with other women, and at the same time insists that he had no physical relations with Beatrice. But "after she had gone, I was as before, always thinking of sex. I would go from one place to another, looking for a woman with whom I could have relations." He "became acquainted with lots of other girls and tried to have relations with them all. . . . No matter how many of them there were, I always tried to have relations with them all."

Separation and the Letter.—After war was declared, he had a touching leave-taking with Beatrice, but when he left the ship in France, he "was only thinking about how and where I could find a house of prostitution." He found one, and had relations with a prostitute three times before he left. He says that during the war he had intercourse with at least a hundred women and that each one of them was immensely satisfying.

He received at least thirty-five letters from Beatrice. Then came a

letter in which she told him that "she had been married and that she thought it best that we sever all relations." This appears to have been the turning point in his history, the moment from which his neurosis developed by leaps and bounds. He describes the effect of this letter as follows:

I could scarcely believe my eyes. I was not conscious of what went on around me. I felt as if I were being lifted from this earth into some other planet. I did not seem to be able to breathe, I was choking. There was a feeling as if I were being hit with a hammer over my head, which throbbed terribly. Then I began to get cold, as if ice water were being poured down my back; then as if I were burning up. I began to sag at the knees. I could not get my thoughts together, and I was not brought back to a realization of things until one of the officers gave a command and, as I did not respond, he came over to see why. Seeing I was in a sort of daze, he took my arm and tried to help me back into one of the numerous dug-outs. I seemed willing to do anything, but my muscles seemed unable to move. They would not obey my mind. I seemed to be glued to the spot. All that was running through my mind was the thought of this girl back home.

Even after I was brought out of this daze and wanted to follow this man who was there with me, my mind wanted to go but the other parts of my body would not function. My legs and arms refused to move; they were as if they had no life in them. I could not move one inch forward or backward; my arms would not move, I could not move them at all. In fact, all of my body seemed totally paralyzed; my mind seemed to be the only part of me now functioning. This lasted for a few minutes. All of a sudden I seemed to come to life. My mind seemed to clear and there was a feeling that I wanted to kill, and nothing else. I seemed to realize all that was going on around me and jumped from the place where I was standing and started to shout at the top of my voice, calling the enemy all the vile names that could be thought of. I cursed them as a whole and as one individual. I wanted to do away with them the quickest way possible.

How the killing of my enemies would relieve me, I cannot say. All that I do know is that I wanted to kill and keep killing until I myself was brought down by the enemy.

Some of the psychosomatic symptoms which he has described in connection with the psychic trauma represented by the receipt of this letter are similar to those which later preceded some of his fugues or other abnormal psychic manifestations associated with his developing neurosis. Here also begins the "hate" motif which lies in back of his pyromania, his robberies, and his homicidal impulses. In other words, this one letter, signalizing the loss of the patient's love-object, was the beginning of a continuous neurotic development which assumed the proportions of frenzy and madness.

A Vision.—There also occurred in France the first of the hallucinatory episodes which he refers to as "illusions" and which afterward became increasingly associated with his pyromania. His account of this reads as follows:

> About dusk we reached a small village where we were to stop for the night, to sleep in the woods, getting the best protection from an airplane raid. As we reached these woods I seemed in an atmosphere of haze; I could not see clearly. Always a thought of the girl was forming in my mind. As I was thinking of these things, my thoughts were scattered by the blast of an exploding bomb that had been dropped by an airplane that was attaching this town.
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> The screams of the dying and wounded horses and people seemed to freeze the blood in my body. I stood lifeless and thought of myself as a piece of ice.
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> As I stood there watching this awful scene, orders came for the first platoon to make a run for this town to give as much aid as possible to the injured there. I was one of these and was soon in this war-stricken town.
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> By this time the flames and bombs had spread to practically all the buildings in this town and it was like a huge furnace. We worked frantically for about an hour and had gotten many of the civilian population into the hills where there was more safety, but there were many wounded whom we could not reach. Soldiers too were there, many of them dead or wounded. . . .
>
> I saw that the smoke from the burning buildings was making funny pictures. It looked as if there were a picture forming in the clouds of smoke, but there was no head on this picture of a woman. Finally as I stood there watching, with every muscle in my body tense, I saw that there was a head. God! It was a picture of the girl. What a wonderful sight! She had her hands stretched out as if to welcome me, as if in a dream; even her face was as I had seen it the last time. The vision lasted, as near as I can judge, for possibly a minute and appeared just once during this conflagration. For a time there was nothing in connection with the conflagrations during the war that I could figure out had any influence on my future behavior, but now it is quite clearly the opposite, as I can see that the illusions that were so realistic to me then were the cause of my subsequent actions. There was in my mind the thought of a girl, that I had seen her, and why not again? It was a way of relieving the tension that was within me that had to find an outlet in some manner, and the subsequent actions were the result of these scenes during the war.

In this episode we find the connection between fire, smoke, and hallucination. Not all of his subsequent associations, however, were associated with pyromania, but all of them were repetitions of this initial vision of Beatrice.

Return from Battlefield.—Following his return from France, his

mother observed a marked personality change in him. He was restless, argumentative, showed little interest in things, and could not hold a job for any length of time.

About four months later he met and kept company with a woman to whom he had been introduced by his sister. Some months later, while they were discussing a hunting trip on which they and several other couples were going the following day, and while this woman was examining the service gun which the patient had brought from France, she was accidentally shot, and at first there appeared to be little hope for her recovery. When finally she did recover, her mother made it clear that she expected them to get married. The patient did not love this woman, but appears to have considered himself under obligation to marry her because of the shooting accident. Seven months elapsed before this marriage took place. In the meantime there had been a meeting with Beatrice, who explained that she had been coerced into marriage by her parents, whose pro-German sympathies had turned them against the patient; that she did not love her husband, and was willing to live with the patient part of the time if he wished it. He refused this offer; refused to see her again or to answer her letters and telephone calls.

Beginning of Fire-Setting.—It was during the period preceding his marriage that the patient began his antisocial activities, including the first setting of a fire. Many of these activities were accompanied by alcoholic indulgence. While he was on the police force, he and another policeman shot up a dance hall. They were both drunk. He claims that this was motivated by suicidal wishes; that he hoped to place himself in a position where he might be killed; but he also says, "I became a maniac, as I was during the war"; and we are also told that "All this time I was seeing pictures of this girl." He was subsequently dismissed from the force.

The pyromaniac episode took place during the period of his engagement to the woman whom he later married. He says that he was at her home and read in the paper about the numerous fires that had been started in the city.

> I became deeply interested in this and finally thought: Why did I not do something of this kind to relieve the strain or tension that seemed to worry me so much? So it popped into my head that I would do it, and bidding the girl goodnight, I proceeded to go around the immediate neighborhood. Finally, I stopped in front of the large warehouses of a furniture company and went to the rear of the store where I gained entrance through one of the windows.
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> After I was in this place, and following some time of thinking and

deciding just what to do, I set fire to it. As there was a lot of excelsior and other trash that comes from unpacking furniture on the floor, it was not very long before I had to leave the place and get outside, as I was beginning to feel the effects of the fumes.

As this was the first fire I had ever started in my life, I waited for the engines to come. It was some time before they arrived, and the fire had gained considerable headway. It was only after the great efforts of a number of companies that they were able to get it under control. I must have stayed there for over an hour watching them, and at the time my mind seemed to be blank except for the thoughts that this was a way of getting revenge on anyone I had it in for, such as this man who had married the girl whom I loved; or rather that I had to rid myself of something that had to be relieved from within me, and that it had to be done or else I surely would not be able to stand much more of the mental conflict that was going on within me.

We now see the connection between this and the "vision" which he had seen in France, for he says:

Reading about fires did not influence me in any way, with the exception of this first time. I was, on this occasion, in such a state of mind that I was thinking of the girl and of how I had seen her on the clouds of smoke while in France, and as I wanted most of everything to see her, would I now see her again on the clouds of smoke? This led to the conclusion that I might see her, and for this reason I went to the place mentioned and set fire to the same. I am unable to state whether or not I would have set this fire had I not read what I did in the papers.

This was the beginning of his pyromania. He thinks that during the remainder of that year he must have been responsible for a hundred fires.

One evening he was at the home of his fiancée, and whenever he looked at her he would see Beatrice in her place. He left her and proceeded to set fire to the warehouse of a lumber company. Then he went home, but could not sleep.

I wanted to get something off my mind that I could not seem to lose, and I was ready to do almost anything to accomplish what I wanted. This worry was over the coming marriage, and I couldn't make up my mind whether or not I really wanted to get married to her, so I decided to set fire to another place.

He did set another fire. "After this fire there was a feeling as though I were another person entirely different from my real self. I seemed to forget all of the worries and trouble I had, and was in a very good mood when I reached home" (p. 23).

Several months prior to his marriage he thought he saw Beatrice

on the street. It was not she, and this incident plunged him into continued worry over the coming marriage. He had vague thoughts of going to her, taking along poison, and doing away with both their lives. He purchased a quart of alcohol, went into a wooded park and drank it. He then saw a vision of Beatrice, who seemed to be beckoning to him. He left his car and started to go to her, and fell into a stream.

On a later occasion he had a vision of her while he was at work painting panels on an inside wall. "She seemed to be so real that she seemed to move." He was finally interrupted by another workman, who observed that the patient appeared to be "seeing things." The first of these visions is an alcoholic hallucination; the second appears to have resulted from a sort of involuntary hypnosis. They are "hallucinatory" only to the extent that they are false sense perceptions. They are projections of thought, just as psychotic hallucinations are projections of thought, but they are not the hallucinations of psychosis. He is aroused from the first by falling into a stream, and from the second by the inquiry of a fellow worker.

As the date of the wedding approached, he became increasingly absent-minded, forgot to keep engagements, to get the necessary things for the wedding, etc. He tells us that:

> As the time for the marriage approached there was not the least thought in my mind of love. All that I was getting married for apparently was to get even with Beatrice, and also to have a woman that I might have intercourse with every time I desired. But I found out that I was to be disappointed.

During the marriage ceremony he had another vision of Beatrice and thought that it was she whom he was marrying. He says that he only realized what had taken place when they were leaving the church.

Their marital relations were thoroughly unsatisfactory. His wife had been told after the shooting accident that childbirth would be fatal for her, and consequently he was obliged to use precautions in having relations with her. He derived practically no gratification from their relations, and says that "I was always going around with practically every woman with whom I had a chance to go." He experienced some guilt feelings on this account, but his sexual urge appeared to be insatiable, and he says that "often I felt as if I should really die if I did not have sex relations with some woman" (p. 63). He met a married woman who told him that her husband could not satisfy her, and their association lasted for seven months, with relations three or more times a week. Another similar relationship, with another married woman who told the same story, lasted for about three months. Referring to these and other extramarital relations, he says, "I was seeking something in them

which I was sure I would eventually find if I kept seeking" (p. 64). This statement is highly suggestive of the pressure of an unconscious homosexual component, but there is nothing in the man's history to indicate the least manifestation of any homosexual interest.

His married life was further complicated by difficulties with his mother-in-law, who appears to have been a thoroughly neurotic individual; and by difficulties with his brother-in-law, who seems to have been generally meddlesome and troublesome, and against whom the patient, on more than one occasion, developed strong homicidal impulses. He also developed homicidal impulses against his wife, but never attempted to act on these, as he did on those directed toward her brother.

After his marriage there was a succession of episodes involving antisocial behavior, and many of these were associated with fugues. One night he awoke, dressed, and went to the office of a hotel, which he found empty and where the safe was open. He took $80.00 in small bills from this safe, pocketed it, went home, and slept. In the morning he thought that this was a dream until he discovered the money in his pocket. He put the money in a large envelope and left it on the office desk when no one was there. Shortly after this he robbed an automobile repair shop of a large supply of tires, tubes, etc., apparently with no knowledge of what he had done until he got home and found the back of his car filled with all this loot. He later dumped it in a ravine. This robbery, however, was also accompanied by pyromania, for he set fire to the establishment before he left. He says that "there was a tension within me that seemed to be released after I had caused some damage" (p. 14). It should be observed that both of these thefts involved no predatory motive. In the first instance he returned the stolen money; in the second, he threw away the stolen property.

In the early part of the year in which he was apprehended he looted six stores, one after the other; left all of the stolen money and property in the last store, to which he then set fire. Referring to this episode, he says:

> A desire to kill seemed to be in my mind at the time of setting this fire, but against whom this desire was directed, I am unable to say. It was not long before the fire was discovered by a passer-by, and the fire department soon came. There was very little damage done. Next morning they found all the things that were taken from over six stores.

In the same year he held up the proprietor of a gasoline station and took $400 from the cash register. He remembered nothing thereafter until he found himself parked on the shore of a lake. Then, realizing what he had done, he went back and returned the money to the

proprietor, who had known him as a customer and "claimed that he knew the moment I entered the place that there was something wrong with me, and that he thought I was drunk, so he did not call the police."

Referring to a period after his marriage, he describes a fugue followed by a fire. At this time he was working for a large business establishment and was engaged on a renovating job at a local store. He sat down on a box in the basement, and when he came to himself it was 8 P.M., everyone had gone and the store was locked. He then set fire to the establishment, remained until he was nearly overcome by smoke, when he went to the second floor, forced open a window and jumped into the alley. In connection with this same period, he says, "I remember setting over ten fires, but can remember very little that took place at them."

Sometimes he describes periods of great remorse following these pyromaniac episodes, when:

> I could not sleep from crying, thinking of the damage done and the misery caused these people who had never harmed a hair on my head, people whom I had never seen.

But at other times it was a different story.

> There were a number of occasions when I was still in the vicinity of the fire and watched them bring out people who lived there, sometimes on ladders, sometimes through the doors, etc., and at the time I never gave it a thought that I was doing someone else wrong. I never considered that I might have done injury to them. There was no one seriously injured in any of these fires that I know of, and I am positive no one was killed. When the urge to do these things came to me, there was no thought in my mind of the possible consequences either to myself or to others. . . . There was a great relief from mental depression that was not relieved in any other way, but surely there was no shock or thrill. It was nothing more than an outlet for the pent-up revengeful feeling that was constantly on my mind (p. 27).

Both of these contradictory statements are probably true with respect to different periods. They are typical of the strong ambivalence which characterizes the man's personality make-up.

He recalls being in a feed store, "and when I came out the whole place was on fire. . . . I don't know how I got in, as it was locked, both front and back, nor did I know the owner" (p. 25). On another occasion he went walking in the woods, and when he got back to his car "the whole woods surrounding me were on fire, but I do not know whether or not I started this fire." After this he was confused and felt "as if someone were pouring ice cold water down my back."

Following difficulties with his mother-in-law, he set fire to a box car in the railroad yards, and shortly thereafter to a manufacturing establishment; then he drove out into the country and set fire to a barn. One night he set fire to a market, and the next night to a furniture store.

In the following year he started a fire in a lumber yard. "I was still sitting there when the fire department came, and they pulled me out. They thought I was a night watchman who got caught in the flames."

He says that "there is no physical effect that I know of having experienced by these acts." Of course, we don't know what *he* means by "physical effect," but the statement is not entirely true, for the patient, after he had been discharged from the hospital, admitted that he invariably masturbated during these pyromaniac episodes, a fact which previously he had steadfastly denied. By "physical effect" he probably means distressing physical feelings. As a matter of fact, feelings of this kind usually preceded rather than followed his flight into pyromania.

He describes another occasion on which he set fire to a huge pile of hay that was being stored in a shed for the winter. In connection with this fire he saw a vision of Beatrice in the smoke; and "while looking at this picture . . . all my worries and troubles seemed to be lifted from my shoulders" (p. 28). This vision became increasingly associated with the episodes of pyromania. He remembered the vision of her which he had seen in France in the smoke of the burning village and thought, "Why not set fire to a place and see if I could still see her."

> This I did, and to my surprise I did see her as before. Many times after this I would go to places that I knew were unoccupied and set them on fire just to get a glimpse of this girl. Then it became a habit. Every time I would feel blue I would set a place on fire, and it seemed that after I had seen this girl I would be able to stand things better for a time.

He had another vision of Beatrice while he was standing on a ladder leading to the attic of a new house on which he was working. This, of course, was one of the several visions which were entirely independent of pyromania.

During the year preceding his apprehension and commitment, his mind "was filled with thoughts of killing the whole family."

> I was continually setting fires in every place that I could. This was the worst period in my life for these things, and nothing but fires or the damaging of some place seemed to do me any good. All these things seemed to comfort me to a certain extent. Most of these things I am unable to recall, as at this time I was in such a state that I could hardly realize that I was alive.

He continues:

During the next three months I was everywhere, doing things that were terrible. I was setting fire to places one after another and stealing or destroying what I found in these places. I went to a garage and set fire to it, completely destroying it. This was in December, I believe. . . . There must have been at least a hundred if not more of these places that I entered and either fired, robbed or damaged. It is impossible to tell about them except that I realized I was there.

Because he had seen "the picture of the one girl I loved" in the smoke of a burning building to which he had *not* set fire, he went to another place and set fire to a warehouse, hoping for a repetition of the "vision." He was disappointed, however, "for they had the fire under control too soon for any smoke to form into a picture" (p. 32).

I remember going to at least five other places this night and the next morning and setting fire to them. I also remember hunting for the picture to form as the smoke rose into the air, but I cannot say whether or not I saw this picture any more on this occasion. . . . There was a feeling that all the world was coming to an end and that I was going to accomplish this, and was out to do as much damage to all people and property as I could, thinking at the time that this would compensate me for all my suffering (p. 32).

This series of fires resulted in his apprehension by the police.

Hallucinations.—We have already mentioned several of his "visions" of Beatrice, both those associated with fire and those which were independent of that element. In the year preceding his apprehension he was having continued trouble with his in-laws, and wandered away without any knowledge of his direction until he found himself sitting on a bench where he and Beatrice had often sat in former days. It then seemed to him that she was sitting there, too.

She was telling me not to worry, that it would be all right in time, and that I only had to wait for her in order to make life worth living. This all seemed so real that I could not think of anything to say to her, and I did not speak one word during my stay there. Finally I seemed to come from a sleep, and it was then that I knew that I had had an illusion, and was truly sorry that it was so.

Here there was neither alcohol nor fire. This "illusion" occurred while he was sitting on a bench, and he says that "Finally I seemed to come from a sleep." It is quite possible that this particular "illusion" was actually a dream. He says also that "every time I tried to touch her I seemed to float away from her," which is a more or less typical dream situation.

On another occasion he was driving with his wife and his mother-in-law, and as they neared the bank of a river he suddenly swerved the car off the road into a deep ditch because he had seen a vision of Beatrice on the road in front of him.

It was an image of her, even the clothes she had on. I would have sworn at the time it was she. I was between the devil and the deep sea to decide whom I was to hurt. I had either to hit her or I had to turn the car and take a chance on whether or not it went into the river, perhaps killing all the occupants.

Once when he was in the mountains with his wife he had a vision of Beatrice beckoning to him, and would have stepped off a precipice into a canyon if his wife had not grabbed his arm and pulled him back to safety. He says, "I was asked about this many times later, but I could give no answer as I did not want to tell her the truth."

Of course, the patient's term "illusion" is not correct. The early childhood episode previously mentioned, in which he mistook the cat carrying a mouse for the devil with horns, was an illusion. Inasmuch as these visions of Beatrice are false sense perceptions—not misrepresentations of something actually seen—they are hallucinations, except in those instances where they may have been dreams; and yet there is something dreamlike about all of them. They are really projections of deep phantasies.

Fugues.—We have already referred to some of the patient's fugues. On one occasion he had visited the home of a certain woman with whom he had been having sexual relations for a period of weeks.

As I approached the car I felt as if there were a cold chill running through my spine. The weather was very mild yet, it was not cold, but I felt as if I were going to freeze. I recall stopping the car and getting out to go in a drugstore to purchase some medicine. I cannot say whether I ever went into the store, but the next thing I remember is that I awakened in bed in a hotel in Akron and had been there all night. How I got there and by what means, I am unable to say. No one ever told me.

One night, after he had been married for about two years, he was out riding with his wife, when "I felt as if there were someone pressing a heavy weight on my head and as if I were going to faint." He stopped at a drugstore, got a bromo-seltzer, went home and to bed. An hour later he awoke feeling worse than ever, got up and decided to take a walk. The next thing he remembered was finding himself sitting on the bank of the river.

When I got home I was surprised to find that I had been gone for three days. I cannot recall any one place where I had been during this

time, as my head seemed to be a total blank. I evidently did not sleep out in the open, as my clothes were not rumpled or dirty, but looked as if I had had them cleaned and pressed the night before.

In the same year he once started home from a job on which he was working, and the next morning when he got out of bed to return to the job, discovered that he was not even in the same town where he had been working. He believed on this occasion that there had been a woman with him, but when he awoke in the morning he could find no signs of anyone having been there. He was never able to remember whether he had actually been with a woman or not.

Referring to the same period, he says:

> During this time I was finding myself in places where I did not remember ever having been before and did not know how I got there. I would find myself on people's doorsteps and in houses where I did not belong.
>
> There were times during this period when I would become enraged with all the in-laws and myself, thinking of Beatrice, and after spending hours thinking of them I would lose all consciousness, and while I remember that I was wandering along the streets, I could not remember how I had gotten there, nor could I remember what I was thinking of at the time . . . (p. 44).

Following a quarrel with his wife, he left home with the intention of going to Chicago. He picked up a woman in Toledo, took her with him, and lived with her for over a month under the impression that she was his wife and marveling at the fact that they were getting along so well together since they were away from the family. During this period he secured employment and received high praise from his employer. This situation was terminated when he received a physical injury which required treatment by a physician, whose questions brought him to the realization that he was actually with a woman other than his wife. His precise mental state during this interval is difficult to evaluate in the light of the information obtained. Apparently he knew where he was, and must have known at the time what he was doing, although he says he could not remember it afterward; but he was completely disoriented with respect to the identity of his female partner. There was at least a partial dissociation involved. Confusing the woman whom he picked up in Toledo with his wife, and marveling at their "marital" harmony, suggests a wish-fulfilling mechanism behind the amnesic state.

Homicidal Impulses.—These impulses have been mentioned briefly. On one occasion he "decided to get drunk to see whether it would make me forget my troubles and worries." He drank a quart of wiskey,

then parked his car in front of the house where Beatrice lived with her husband, with the intention of shooting her husband when he came out.

I waited there for fully an hour and all this time I seemed to be getting madder and madder at this man. Finally I went and knocked on the front door. A colored woman came to the door and told me that this man and his wife had gone out of town on a trip and would not be back for a week or so. It seemed to make me feel worse not to be able to do with this man as I wished and as I had planned that evening. I then went home very disappointed. I have thought many times of how lucky it was for them and for me that they were out of town that night. I really believe that I might have killed either the man or both of them if I had been able to do so. Still there was no motive for killing the girl, and I believe that was one act which it would have been impossible for me to commit.

Commenting on this situation, he says, "Just why I wanted to harm this man is beyond my comprehension. I had never seen him and surely held no hard feelings against him except probably that he was living with the woman I wanted." His impulse was, of course, completely irrational and without any true motive; but it was also largely an alcoholic reaction.

He once suddenly determined to kill his brother-in-law after the latter had been to the patient's home and had tampered with a motor in the basement.

The urge was something like compulsion, that I had to do it to relieve my mind. It seemed to me at the time that there was someone that had hold of my body, someone or something that made me act without my having anything to do with it. Whether I wanted to do it or not, I cannot say. It may have been, as I figured out, that there was one part of me that wanted to do it and another part of me that wanted not to do it; and this other part seemed to have the edge, as I was able to stop just in time.

He waited in the garage with a gun under his coat, but was deterred by thoughts of Beatrice and the realization that if he did this, he would never see her again. These thoughts apparently took the form of an auditory hallucination, for he says:

This voice, or whatever it might be called, was not like a person speaking; it was more like something within me that prompted me not to do what I had in mind. It was as if there were someone inside of my head who was telling me what to do. Although it sounded like a voice at the time, I now realize that it was far different from what I thought at the time. At that time there was not any thought of this voice being unreal, and I took it for granted that it was real; that in some way this girl has been able to communicate her thoughts to me to keep me out of the trouble which I was on the verge of getting into.

Was this or was it not an auditory hallucination? His own description is contradictory; he says that "it was not like a person speaking," but that "it sounded like a voice at the time." He also says that "at that time there was not any thought of this voice being unreal," yet he seems to have regarded it as a telepathic communication.

On another occasion, when he was riding in his car, he saw his brother-in-law "and I pulled the gun from the pocket of the car and was just about to pull the trigger, after pointing at him, when a feeling came over me that it would be all wrong for me to do this, and at the same time there was a feeling as if someone were pulling my arm down toward the pocket of the car. Then I put the gun away."

Here we have two homicidal impulses directed toward the same man. The first is prevented from fulfillment by what appears to be an auditory hallucination; the second is accompanied by a more conscious mental conflict. While the patient's brother-in-law appears to have been a generally disturbing factor in the family relationship, there is no clear explanation as to why he was singled out to be murdered. The patient himself thinking that "it may have been caused by the condition I was in at the time—one of hatred for everybody and everything."

Suicidal Impulses.—The patient's thoughts of suicide were always accompanied by the rationalization that it must be effected in such a manner that no one would recognize the suicidal motive. Therefore, of course, it was never effected at all. As in practically every neurosis, there is no genuine suicidal urge. The individual contemplates it, thinks about it, plans it—but never accomplishes it. He thought that suicide, if it were recognized for what it was, would bring disgrace on "the ones I held dear." The absurdity of this reasoning is obvious. What he had already done, and what he was doing from time to time during this period, would have brought far more disgrace on others, had he been detected, than would a suicide.

He tells of another occasion when he and his brother were engaged in target practice in the basement, and he started to go in front of his brother just as the latter pulled the trigger of the gun.

> While there was a very strong desire to die, or rather to be killed, it was not that I wanted to kill myself. I wanted to die by the hand of someone else so there could not be the slightest suspicion that I had done the act myself. I could not consider death at all if there was the slightest chance that I might have been involved. Thus by getting in the way of something that would have killed me, it would have looked like an accident and would not have been thought of as suicide. . . . He saw me in time to throw the barrel up in the air, thereby avoiding hitting me with the bullet.

In this case the connection between suicide and homicide is very close. The suicidal impulse appears to be merely the reverse of the homicidal impulse, but there seems to have been no rationalization with respect to the latter. He was kept from homicide by visions, hallucinations, thoughts of Beatrice, etc. Suicide was synonymous with "disgrace," but he never seems to have thought about the disgrace of homicide, any more than he thought about the disgrace of pyromania.

Discussion

Here we have a fulminating neurosis marked by such violence as to lead the average observer to conclude that the patient was psychotic; and several of the early diagnostic opinions did assume that he was the victim of a psychosis. These were predicated in part on false information given by him, and on false attitudes which he assumed for the purpose of strengthening an insanity plea. From a social viewpoint, of course, he certainly was insane, but the evidence presented by his account while undergoing psychotherapy shows that his "insanity" was that of a severe neurosis rather than that of a psychosis.

Because of the original suspicion of a psychosis, we are first of all disposed to look for a hereditary taint or at least almost continuous environmental influences contributing to early and steadily progressing neurotic development. But we do not find either a marked tainted heredity or any early indication of a neurotic trend. It is true that we know next to nothing about his father, but the little that we do know is not indicative of abnormality. His father was an active man, was apparently a good husband, had 10 children, was generous and helpful to his own detriment. Presumably he committed suicide as the result of financial reverses, although the patient refuses to believe this and claims that his father's body was never satisfactorily identified. His mother appears to have been a mildly neurotic individual, given to unnecessary worry, yet capable of energy and fortitude in the early years of her widowhood. We have a history of one suicidal attempt following her disappointment when she had been led to believe—on what would appear to be an altogether insufficient basis—that her lost husband was about to return. With the exception of one brother who committed suicide in middle age, there is nothing in the patient's account of his siblings to indicate that any of them exhibited outstanding neurotic traits which interfered with his or her progress. We thus have no evidence of any hereditary factory which justifies an expectation of abnormal development.

Nor do we have any evidence of conflict within the family which would contribute to a neurosis. He claims that there was seldom a

quarrel in the family and that the children always got along well together. There was no oppressive religious element; different members of the family followed their own religious inclination and became affiliated with churches of different denomination. The patient himself became a Catholic, probably to please his mother, but remained without any real interest in religion.

We do find in his statements, however, a mention of certain traits which indicate a possible neurotic disposition. He "was very restless as a child, always had to be going somewhere or doing something." Now this is not unusual in many normal children, but in view of his later development, it suggests in his case a possible unconsciousness source of dissatisfaction which might have lain behind his restlessness. He says that he cannot recall anything in his life as a child that made him unhappy except being denied something, which he attributes to being used to getting everything his own way; and says that, at about the age of ten, he would "fly off the handle at the least thing," and would throw anything he could reach at the first person who came near him. We seem to see here a foreshadowing of the aimless character of his later moods of hate and revenge in the face of frustration and denial. He recalls one early nightmare at the age of five when he woke up screaming, although he cannot remember the content of his dream; and he has described the early illusion created by the cat with a mouse in its mouth, which he mistook for the devil with horns crawling toward him. We have a history of nail-biting and nervousness at 13.

The patient's early sex life does not appear to show anything particularly abnormal, but generally follows the pattern established by the average boy, perhaps somewhat precocious. He was initiated in masturbation, in the company of others, by an older boy, when he was little more than eight years old, and later practiced this about once a day, the practice being accompanied by phantasies of girls concerning whom he had already become curious in connection with a variety of peeping episodes, all carried out in the company of other boys. He had his first heterosexual experience at the age of twelve with a colored girl. He had some thoughts of trying to persuade one of his sisters to let him have sexual relations with her, but always abandoned this idea, knowing that it would cause him to become an outcast. He doesn't think that he had such ideas about any particular sister, saying that one would do as well as another. At the age of fourteen, an aunt toward whom he had previously felt some sexual attraction seduced him, and they had sexual relations for nearly three years, these being interrupted by his enlistment in the Army. It may properly be said that

he was sexually precocious, but so, apparently, were most of the other boys with whom he associated. His development seems to have been a consistently heterosexual one, and there is no mention in his narrative of any homosexual episode. It is entirely possible, of course, that there are a number of features of his sex life which he has omitted, but there would seem to be nothing which produced any appreciable conscious conflict or which interfered with a normal heterosexual trend.

Exactly when he met Beatrice, the girl around whom all of his subsequent emotional conflict centered, is not clear; but it was before he enlisted in the Army, and therefore must have run parallel to at least part of the period during which he was having sexual relations with his aunt.

His attitude toward Beatrice is one of the most puzzling features of the case. His love for her appears to have been strictly idealistic. He says that he put her on a pedestal and thought of her as an angel. If we are to accept his statements at face value, they never had any sexual relations or engaged in any physical intimacies. We cannot be absolutely sure about this, but it appears generally probable; otherwise he would not have maintained his abiding interest in her. The role she played in his life appears to be very much like that of an unfulfilled dream, an idealistic phantasy of the future. Certainly he concentrated on her all of his psychic love, which appears on many occasions to have been completely separated from physical desire.

After he entered the Army he paid his first visit to a house of prostitution, and from then on we hear of alcoholic indulgence and excessive sexuality. He admits considerable conflict, with respect to the latter, over "its being a betrayal," but nevertheless appears to have regarded it as a physical necessity. This is one of the outstanding inconsistencies which are difficult to explain. One can understand how he might occasionally seek sexual relations with prostitutes as a relief measure while still being idealistically in love with the girl he left behind him; but his sexuality exceeds all moderation. No matter how many women he met, he "always tried to have relations with them all." How does a man who is so much in love with one woman justify such continued promiscuity?

This excessive heterosexuality may suggest a possible latent homosexuality, but nowhere does he make any statement which tends to betray the least homosexual interest.

During the war he "had intercourse with at least a hundred women," but all this time, if we are to believe him, he was cherishing an ideal love for the girl back home, from whom he had parted so tenderly when he left for France. It is at least a most inconsistent picture.

But the war had made a definite change in the attitude of this

girl's parents toward him, since they were pro-German and had no use for anyone who was fighting against their fatherland; and it was presumably at their insistence that Beatrice married someone else while the patient was overseas.

Here the active neurosis begins. Whatever roots it may have had prior to this time are so well concealed as to appear nonexistent. Upon receipt of the memorable letter from her telling him that she was married, he experienced a series of psychosomatic symptoms which were often repeated thereafter preceding his numerous fugues. These were succeeded by a feeling of such violent abysmal hate which he discharged on the enemy in such reckless fashion as to include the idea of suicide. "All I do know is that I wanted to kill and keep killing until I myself was brought down by the enemy." From this moment onward he was obsessed and tormented by the emotions of hate and revenge, that was to express itself in most violent aggression.

There can be no doubt that the psychic trauma represented by what he considered his betrayal by Beatrice was immensely increased by the horrors of war which, as we know, were responsible for many cases of so-called "shell shock" in men who had no deep emotional problems which could thus be severely aggravated. Indeed, it may be questioned whether, if the news of the marriage of Beatrice to another man had not reached him at precisely the time and place it did, he would have reacted to it in any such violent manner. Reading his description of the terrible scenes which he witnessed in France, we cannot escape the conclusion that war was as much responsible for his madness as frustrated hope and what he considered "the pangs of despised love." It took both of them together to produce such a strong emotional reaction. Another factor which may enter into the situation is that Beatrice's letter does not appear to have given any adequate explanation for her action. She does not appear to have told him at that time that she had been forced into an unwelcome marriage, but merely that she was married and considered it best that they sever all relations. The modifying explanation was given to him later by his sister, and still later by Beatrice herself, but in the meantime the damage had been done. All that he could feel, when he got the letter in France, was that he had been rejected; that his "angel" had failed him; that his idealistic dream was shattered; and that to the hell of war there was added the individual hell of denied love.

We now get an account of the first "vision" of Beatrice, appearing in the clouds of smoke from a burning village that had been bombed. This is the connecting link with pyromania. Not only did the later pyromaniac episodes—which did not begin until three years after he had been discharged from military service—satisfy his hatred and his thirst for revenge, but they also offered a hope of the repetition of that

"vision" which he had seen in France in the smoke from a burning town. This is indicative of the strong ambivalence which characterizes so many of the man's emotional reactions. Hate and revenge on the one hand and a wish-fulfilling vision of the ideal woman on the other. This ambivalent attitude was also manifested with respect to both his wife and his mother-in-law. Even with Beatrice, after her marriage, he alternated many times between love and hate, and seems never to have been able to make up his mind whether he wanted her or merely wanted to be revenged on her.

It was not until two years after his discharge from the Army that his abnormal mental state became manifest by any aggressive antisocial behavior; and not until a year later that such antisocial behavior took the form of pyromania. During this interval his emotional conflict had been accentuated by a meeting with Beatrice, who told him that she had never loved her husband and that she was willing to live with him part of the time if he wished it. He refused this offer, and finally refused to answer her letters or telephone calls. He says that "there was no motive behind this except that it was a way of getting even with her." His narcissism had been too deeply wounded to permit him to adjust to the altered situation. "Why, if she cared for my affection, did she not wait as we had planned?" He already knew by this time why she did not wait, but that made little difference. She did not wait, period. He seems to have been incapable of making any allowance for the pressure of circumstances. He never seems to have thought of all the allowance she would have been called upon to make, if she had known of all his sexual promiscuity while he was anticipating their marriage. He says that he "did not want her as long as she was the wife of someone else." Whether this is rationalization or whether his early Catholic training had anything to do with it, would be difficult to say. At a later date he certainly had no scruples about adulterous relationships with married women who claimed that their husbands couldn't satisfy them sexually.

His meeting with Beatrice, however, seems to have revived an emotional conflict which until then he had been at least partially able to ignore. The first antisocial act we hear about is the shooting up of the dance hall in the company of another policeman, both of them under the influence of alcohol. He makes an elaborate claim that this was an indirect method of attempting suicide, but the suicide motive throughout his entire narrative is altogether questionable, and is sometimes absurd. Preceding this episode, his emotional conflict had been increased by his engagement to the woman whom he subsequently married, which, as we know, was to a certain extent the result of the

shooting accident for which he may have considered himself partly responsible. This conflict was still raging at the time of his first pyromaniac episode. He says that this was suggested to him by reading of numerous fires which had been started, and that it occurred to him "to do something of this kind to relieve the strain or tension that seemed to worry me so much." He says that "the feeling I had before setting this fire was one of revenge" and that afterward "there seemed to be a heavy load lifted from my shoulders . . . I felt as if I had gotten revenge on all the people who had made life unhappy for me." But he admits that the real reason for setting the fire was the hope of seeing in the clouds of smoke the vision of Beatrice that he had once seen in France in the smoke from the burning town that had been bombed. We are not told that he did see any such vision on this occasion, however. Presumably reading about fires recalled the vision seen in France in connection with an actual fire; and from then on it would appear that the hope of re-creating this vision was the main purpose behind his pyromania; and we are told that "during the remainder of this year there must have been a hundred fires that I was responsible for." We are not told in connection with how many of these fires he saw the desired vision, but we know that he did see it in connection with some of them, while on other occasions he was disappointed. At a much later date—after he had been discharged from the hospital—he admitted that he masturbated during these episodes of pyromania, and we are therefore assured that their primary motivation was a sexual one, and that revenge was a secondary factor.

His accounts of his reaction to these episodes are contradictory. In one place he tells of crying afterward, of wanting to help repair the damage he had done, of praying to God for help; and in another place he says that he never gave any consideration to the possible injury to others which his action might have caused. Both statements may be true, however; the first at one period, and the second at another. The apparent contradiction is in line with the strong ambivalence which characterizes his entire neurotic make-up. In connection with another episode, he vividly describes a vision of Beatrice, and apparently this vision became increasingly associated with such episodes, for he says that "every time I would feel blue, I would set a place on fire, and it seemed that if I had seen this girl I would be able to stand things better for a time."

These visions of Beatrice were not confined to scenes of fire, however. He had one of them while he was sitting with the woman to whom he was engaged to be married; while he was looking at her, she became Beatrice; and this same thing occurred during their wedding

ceremony. He had a vision of her while in the attic of a new house where he was working. He had another in a wooded park while he was under the influence of alcohol, and still another while he was at work painting the panels of a wall; and there was one while he was sitting on a bench where he and Beatrice had often sat in times past. He also had a vision of her in the road in front of his car while he was traveling with his wife, as a result of which he drove the car into a ditch, in order to avoid hitting the imaginary woman before him.

He calls these hallucinatory experiences "illusions." At least one of them is an alcoholic hallucination, and his account of another sounds very much as though it were really a dream, while the others appear to be projections of wish-fulfilling phantasies accompanying dreamlike states. They are a part of the continual conflict between love and hate which is responsible for the pyromania and also for the numerous fugues, as well as the meaningless thefts, robberies, the single holdup which he has described, etc. At no time did he engage in any predatory theft or profit in any way from his stealing. Sometimes the money was later surreptitiously returned; in the case of the holdup, he himself took it back to the proprietor of the establishment; in one instance, after robbing six stores, he left all the stolen money and property in the last store, to which he then set fire. On another occasion he found himself with a car full of stolen automobile accessories which he took to some distant spot and dumped in a ravine. Some of his fugues were ushered in with psychosomatic symptoms reminiscent of those which he first experienced in a trench in France at the time he received the letter from Beatrice telling him of her marriage to another man; and it seems probable that all of these fugues were essentially a repetition of the hysterical state of dissociation which made its first appearance at that time. In the most outstanding example of these fugues, he left home, picked up a woman, went with her to Chicago, lived with her at a hotel under the impression that she was his wife, got a job and did highly acceptable work for which he was subsequently praised by his employer, all apparently without any true realization of the existing situation. This lasted for over a month and terminated when he received an injury to his foot while at work, which required treatment by a physician whose questions aroused him to a realization that he was not with his wife. This particular fugue was precipitated by family difficulties. The case could as well be taken from Janet's description of like cases.

His reaction of hatred and revenge did not express itself exclusively by pyromania, but also included, in addition to the thefts, robberies, etc., a number of homicidal impulses. He once contemplated killing

his wife, and twice started to kill his brother-in-law. On one occasion he waited for a long time outside the home of Beatrice with the intention of killing her husband when he appeared, and only desisted when he learned that both of them were away on a trip. He never knew or met her husband.

The family situation following the patient's marriage probably contributed its share to the aggravation of his emotional disturbance, but this is difficult to evaluate because we have only the patient's account of the matter, which, after all, is one-sided. His mother-in-law appears to have been a thoroughly neurotic woman, given to sudden and inexplicable mood swings; and his brother-in-law seems to have been a generally meddlesome and disagreeable person; but to what extent these characteristics may have been increased by the patient's own behavior, we do not know. He paints a picture of a long-suffering individual trying to make the best of a bad business, and while this may be essentially true, it is likely that at least some of the objectionable behavior of others was a reaction to equally objectionable behavior on his part. It must be remembered that he had been more or less coerced into marrying a woman whom he did not love, and it would be only natural if his behavior to her and her relatives was marked by considerable unconscious aggression.

The patient fails to convince us that he ever had any serious suicidal intention. He insists that he wanted to commit suicide but that he was unwilling that it should be recognized as suicide. He claims that in the shooting up of the dance hall his real motive was suicidal; that he hoped that he would be shot in the midst of the fracas, and thereby achieve a suicidal aim without anyone having the least suspicion of his suicidal intent. Apart from the fact that this was a thoroughly roundabout way to attempt suicide and that the whole idea seems to be a piece of rationalization, we know that the dance hall episode was essentially an alcoholic episode and that any suicidal ideas, if these existed at all, were probably incidental. Nor can we be at all certain about his story of trying to step in front of his brother's fire when they were engaged in target practice in the basement. We suspect that this involves a good deal of secondary elaboration and is an idea which occurred to him afterward. We may even go so far as to question whether the incident, as he relates it, occurred at all. While it is true that a certain indifference to life may lie behind a great many of his reckless and dangerous acts, we can see no evidence of any definite suicidal intent. His talk about a recognized suicide bringing disgrace on his family is, of course, absurd, for the antisocial activities in which he was engaged would have brought far more disgrace on them if he

had been apprehended. Incidentally, it is strange that, following his apprehension at long last, we hear nothing about his feeling with respect to the "disgrace" which it must have brought on his family. There is no mention in the official record of any suicidal expression following his arrest and commitment to the hospital; in fact, there is not even any mention of a depressed state. No doubt he had a stout sense of guilt, but it was covered by a thick fog of hostility.

It seems to be reasonably clear that we are dealing with an individual of at least circumscribed intelligence. Certainly we are dealing with an individual who is incapable of recognizing or analyzing his emotions. These emotions appear to take complete possession of him, and he reacts to them blindly and stupidly. He is in some respects not unlike one who in Biblical times was said to be "possessed of a devil." He is controlled by blind hate and revenge, but is without any intelligent plan of revenge. He himself says more than once that he cannot see how or why doing what he did would serve any purpose; he only knows that after he had done it he was temporarily relieved because of the discharge of emotional tension.

He wanted Beatrice, but he did not want her as a widow; he did not want her as a mistress; he wanted her precisely as she had been before he left for France. He hated her for being unable to fulfill his dream; he hated her husband because he had married her; he hated his own wife because she was a further obstacle in the path to Beatrice; he hates his in-laws (perhaps with some justification in so far as their own behavior was concerned) because they were a continual reminder of the ill-advised marriage that he had made; and he undoubtedly hated himself for having still further complicated the situation by consenting to that marriage. But all of this hatred, with the possible exception of his homicidal impulses directed against his brother-in-law, was without any specific aim or object; it was vented on innocent victims of his fire-setting and stealing. It was simply expressed by his desire to do damage—to anyone or everyone. We are familiar with the hatred of one individual which is displaced on to another and concealed by rationalization; but here we have hatred born of frustration and displaced on to everybody and everything. Its character is stupid and its manifestation is all but psychotic.

The psychologic examination given three months after his admission to the hospital also appears to be indicative of a somewhat restricted intelligence.

Apparently the official diagnosis was dementia praecox, this having been made on the basis of admitted hallucinations and an impression of emotional indifference. We have already seen that the so-called

hallucinations were not those of a psychotic, but rather hysterical in character, and that the emotional indifference was largely assumed. His subsequent adjustment, after more than two years of hospitalization, completely refutes the original diagnosis, and his personal account is an additional refutation of the theory that he represents a case of dementia praecox.

"Compulsion neurosis" is hardly a correct description because the man's behavior was essentially impulsive rather than compulsive. Moreover, his reaction to his antisocial behavior was not consistent, if we may rely on his narrative, for there were times when he was overcome with remorse for his mad and destructive acts, and other times when he remained indifferent to the disastrous consequences of his behavior. There was also a certain inhibitory factor accompanying many of his activities. While he impulsively stole and robbed to satisfy his thirst for revenge, he never kept any of the stolen money or property for his own use, but either returned it, left it behind him, or threw it away. His homicidal impulses were also characterized by a considerable amount of inhibition. He himself usually attributes his failure to commit murder to some extraneous circumstances, but it appears altogether doubtful whether he would ever have actually taken a human life. The restraining visions or thoughts of Beatrice on some of these occasions were, of course, a disguised form of inhibition. He himself appears to think that he might have killed her husband, or that he might have killed his brother-in-law, had it not been for this or that circumstantial interference, but we do not believe that this is true. While it is true that, in his pyromaniac activities, he was often indifferent to human life, this was because fire represented the means for necessary emotional release. There were no positive homicidal thoughts in connection with his fire-setting; but merely a negative disregard for possible danger to human life. All of his positive homicidal thoughts were directed toward specific individuals.

To the extent that his fire-setting was motivated by the desire to see the vision of Beatrice in clouds of smoke, we may say that he was the victim of compulsion; but where such activity was prompted by a general feeling of hate and revenge, it was strictly impulsive. Moreover, there were long periods during which he was able to abstain from antisocial behavior, which is contrary to the picture presented by a true case of compulsion neurosis.

It does not appear that in this case any of the physicians who were interested in making a diagnosis fell back on that old war-horse, psychopathic personality; perhaps because they were at first so certain that the patient represented a definite psychosis. In the light of the extensive

antisocial behavior, however, some comment on the question of psychopathic personality appears to be called for. It should be obvious to anyone that we are not dealing with a psychopath. Psychopathic behavior we do have; but there is nothing of the psychopath in the patient's make-up. At no time did he engage in antisocial acts from predatory motives; they were all emotionally motivated. He never profited in any way from any of them, and never sought to profit from any of them. Moreover, we have in this case ample evidence of an enduring and extravagant affection—something which is never found in the psychopath, who does not and cannot love anyone. We have also ample evidence of depression. The psychopath is rarely depressed, and when he is, it is merely the depression of frustration, like the sulking fits of a child who cannot get all he wants. In this case also we have periodic fits of remorse, an emotion that is completely foreign to the psychopath. The question of psychopathy, therefore, may be dismissed. We have here a violent and fulminating neurosis, with psychopathic behavior, but there are none of the personality traits which characterize the psychopath.

It is clear, then, that we have here a neurosis and not a psychosis, but a neurosis of such an extreme character as to render the patient "insane" and "dangerous" from every social point of view. He was in fact little short of a madman, but psychiatrically considered, he was not psychotic. "Hysteria with fugues" is probably the most accurate description of his intense emotional disorder. It fits in well with Janet's original description of the condition.

Concerning the "hysteria," however, there can be, in the words of Gilbert and Sullivan,

> "no manner of doubt,
> No probable, possible shadow of doubt—
> No possible doubt whatever."

Granted that the violence of his reaction far exceeds what we ordinarily think of as hysteria, and approaches more nearly what we think of as insanity, the fact remains that all of his emotional eruptions are strictly hysterical in character, and that we are confronted with a neurosis and not a psychosis.

In spite of his extensive historical narrative, there are many things about this man which we should still like to know. His account of his siblings is mainly biographical. We should like to know much more about the interpersonal relations which existed between him and them. We should like to know whether there were any homosexual episodes in his early life, when and how he first heard of homosexuality, and

whether or not it presented any temptation to him at any time, to which he reacted in any particular way. We should like to know the exact nature of his relations with Beatrice, whether these were as idealistic as he maintains, and more particularly just how he felt about and thought of her. We should like to know more about the narcissistic phase of his development and how it affected his personality make-up. We should like to know whether the accidental shooting of the woman to whom he was engaged, and whom he later married, partly we believe because of that accident, was as unconsciously accidental as it was consciously. We should like to know more about what his mother read to him when he was a child, and to just what extent it is reflected in the "magic" dreams to which we have already referred. And there are some other factors which might throw more light on his personality development. Since he refused for so long to admit that the pyromaniac episodes were accompanied by masturbation, we feel that there are probably a number of other things about which he has remained silent. But these possible unknown factors are relatively immaterial, since it has been demonstrated that his neurosis, severe as it was, proved susceptible to psychotherapy and that he was ultimately able to take his place again in society and to lead a useful and comparatively happy life, completely divorced from the neurotic nightmare represented by the account which he has given of the seven years preceding his hospitalization.

Summary and Conclusions

A case was presented of an adult white male with a relatively negative heredity and a much sheltered early life during which he was subjected to less stress and strain than the average boy, and quite free from the ordinary tensions and frustrations. On meeting later in life with a major frustration, having lost his cherished love object, he developed tremendous hostility toward the whole world at large which he expressed in violent destructive deeds of excessive pyromaniac and cleptomaniac activities. Psychotherapy neutralized his hostility and aggression and relieved his tension. On being released from the hospital some 20 years ago and after many tortuous and circuitous happenings, he finally married the girl of his first love and, as they say, they are living happily thereafter.

THE INFLUENCE OF MESCALINE ON PSYCHODYNAMIC MATERIAL

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Some of the relationships between personality structure, psychopathology, and the psychologic phenomena associated with the administration of mescaline and other toxic agents have been considered by several groups of investigators (1, 6, 7, 9, 10, 11). The major aspects of the responses of the present group of schizophrenic patients to mescaline have been dealt with in other communications (3, 4, 5, 8). The physiologic changes and the effects on behavior and emotions were considered. Brief comments were made on the mental content, including recall of memories, flow of associations, and sexual material.

The purpose of the present paper is to consider some of the relationships between psychodynamic material obtained in direct interview, during long periods of psychotherapy, and the productions during mescaline intoxication. These will be considered under four headings: (a) elaboration of meaningful mental content including relationship of mescaline productions to drug-free dreams; (b) recall of childhood memories; (c) emotional responses, including transference phenomena; (d) flow of associative material and ego defense mechanisms.

Material and Method

The study was conducted as part of an investigation of mescaline intoxication, several phases of which have been reported (3, 4, 5, 8). Synthetic mescaline sulfate (Bios Laboratories, New York City) was administered intravenously to 59 patients (24 men and 35 women) in 0.4 to 0.6 Gm. doses. Careful records of each experiment were kept, beginning with the patient's responses just before the injection and continuing for the next 24 to 48 hours. During the injection and the subsequent three to four hours, essentially verbatim reports were obtained either by recording machine or written notes. In general, the productions were quite spontaneous or elicited by asking the patient how he felt or what he was experiencing. More specific questioning was carefully recorded for later evaluation of its relationship to the patient's response. The protocols were obtained by the author and his colleagues.

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All the patients were thoroughly studied psychiatrically. In the majority of cases, patients had been studied closely either through previous psychotherapeutic contact with the author or a departmental colleague, or on a serial observational basis. Most of the patients had been treated with psychotherapy, many for years before coming to Psychiatric Institute, and some had been in psychoanalysis.

For convenience, the patients were divided into three groups on the basis of diagnosis and deterioration: Group I: Schizophrenia, pseudoneurotic type as described by Hoch and Polatin (2), 17 patients. The leading symptoms and superficial mechanisms were neurotic, including any or all of the following: diffuse anxiety in all realms of behavior, obsessive-compulsive-phobic phenomena, depression, hypochondriacal preoccupation, psychosomatic disturbances, sexual dysfunctioning and marked emotional dysregulation. Group II: Schizophrenia with absent or mild deterioration, 26 patients; hebephrenic, 2; catatonic, 3; paranoid, 4; and mixed type, 17. Group III: Schizophrenia with moderate to marked deterioration, 16 patients; catatonic, 4; paranoid, 5; mixed type, 7.

Results

A. General Observations. The value and pertinence of observations was necessarily limited by the accesibility of the patient to psychodynamic study in the months and years of evaluation and treatment before mescaline administration, as well as by the quantity and quality of his productions while under the influence of mescaline.

TABLE I.

Group	*Pre-Mescaline Dynamic Study*			*Total Patients*	*Elaboration of Content and New Material Under Influence of Mescaline*		
	THOROUGH	PARTIAL	MINIMAL		HIGH	MEDIUM	LOW
I.	13	4	0	17	8	6	3
II.	6	12	8	26	5	8	13
III.	0	0	16	16	0	5	11

As might be anticipated, the pseudoneurotic group was the most valuable for this type of investigation (Table I). All of the patients had been carefully studied, though 4 had been particularly resistant to treatment and hostile to a series of therapists. Of the 13 whose dynamics and historical pictures were fairly clear, 8 gave material under the influence of mescaline that was considered especially valuable in the study. Six elaborated to some extent on pertinent dyamic and psychopathologic material, while 3 accepted the experience in an

"objective," intellectualized manner. These were 3 of the 4 resistant patients in the pre-mescaline study. The pseudoneurotic group of patients, being more accessible, had a more thorough dynamic study before mescaline and were more productive under the influence of mescaline.

Of the 26 frankly schizophrenic patients in Group II, 6 had been extensively studied in dynamically oriented treatment during accessible periods for months to years before receiving mescaline. All but one of these gave useful material while under the influence of mescaline. Twelve of this group were studied dynamically before mescaline to the limited extent that rapport could be established, while 8 were not accessible except for grosser psychopathologic investigation. Of the former, 8 gave material during mescalinization that threw some light on the illness and personality structure, while the remainder of the group gave no special content or were so catatonic or aggressively paranoid that nothing new was learned.

Of the 16 deteriorated schizophrenic patients in Group III, 11 were not satisfactory subjects for intensive study before or during the mescaline intoxication in view of the gross psychotic reaction and the paucity of material associated with deterioration. Five gave some pertinent material under the influence of mescaline.

B. Elaboration of Content. Details of content elaboration under the influence of mescaline were considered under three subheadings: (a) Mescaline material which was confirmatory or an extension of data obtained directly in the drug-free state, (b) that which was confirmatory or an extension of dream material in the drug-free state, and (c) new material. Of the 17 patients in the pseudoneurotic group, we noted the following incidence of response: a-13; b-8; c-9; a and b-8; a, b, and c-6. Group II, 26 patients: a-16; b-3; c-6; a and b-3; a, b, and c-1. Group III, 16 patients: a-5; b-0; c-1. Confirmation of previously know material was relatively common in Groups I and II, while confirmation of dream material occurred less frequently and new material was noted in only half of Group I patients and a quarter of Group II. The reporting of a, b, and c material obtained in a third of the pseudoneurotics. Some of the data from pre-mescaline studies and mescaline protocols of two patients with pseudoneuroitc schizophrenia will illustrate these points.

Case 1.—A 36-year-old salesman, son of an American missionary, who had a 15-year history of severe diffuse anxiety and depression, with several suicidal attempts. He had graduated from college with honors, but subsequently his symptoms forced him successively to give up medical school, divinity school, and teaching college French. Specific fears had never

been expressed except rare references to fear of cancer and death. There was a great deal of psychotherapy as well as psychoanalysis for several years with different analysts. The patient's father, an ardently religious man whom the patient idolized, became mentally ill when the patient was 16 and committed suicide a year later. His mother was a controlling woman who punished him by having him beat her. Under our observation and treatment, the patient was courteous, reserved, and slightly disdainful. He was a rigid, religious man of high moral standards. There had been a succession of steady girl friends, sexuality having been limited to occasional reciprocal masturbation. Frank castration dreams had been reported as well as frank incest dreams involving mother and sister.

Under the influence of mescaline, he was openly hostile, vindictive, and belligerent toward one of the psychiatrists, was quite suspicious and felt persecuted. There was a pervading apprehension, at times approaching panic. He expressed specific fears of death, insanity, attack, and of being alone. In a short period of religious ecstasy he jubilantly reported that all the Jews were being converted to the Kingdom of Christ. Later he was alternately in Heaven and Hell. Heaven was unbelievably good and death was no longer frightening. He spoke of a "new life" which was a "feeling of being God." In Hell, he saw devils with tails and pitchforks.

He commented openly on the nurse being pretty, his wanting to kiss her and of her resemblance to his mother. He asked her to undress and volunteered he should feel embarrassed, but did not. Following recovery, he apologized profusely to the psychiatrist and nurse.

The hostile behavior, some of the phobias, and the religious ecstasy, grandiosity and persecution had not been noted in the drug-free state. His unabashed requests of the nurse and the comments on her resemblance to his mother are consistent with the previous dream material. Certain repressed or unconscious impulses apparently became conscious during the mescaline experience and he was partially freed of his usual conscience-ridden state.

Retrospectively, one might say that these are logical developments of the material available in the drug-free state. They deal with his feelings of helplessness, infantile omnipotence, incestuous strivings, fear of loss of body integrity, and, to some extent, with guilt and punishment in Hell. His ego was essentially defenseless under the influence of mescaline. It must be emphasized that one cannot predict the quality of the response under mescaline, what conflictual material the patient will "select" or how he will handle it.

Case 2.—A 42-year-old woman with a 24-year history of a shifting obsessional-phobic and depressive syndrome. Important considerations included rigidity of character, unresolved attachment to her father, inability to regulate hostility, confusion about male-female differences and genital-

excretory differences, envy of the equipment and prerogatives of a man, fear of sexual contact with men and an inclination to turn to women. In an effort to keep her philandering husband at home she had a younger sister, in the bloom of youth, spend week ends with them. The husband and sister engaged in sexual play while the patient slept. Upon learning of this, the patient was resentful and repudiated any association with the sister. Dreams dealt with the husband-sister-patient triangle, usually in an erotic setting, as well as with sexual-excretory confusion, and with unexpected gifts from women.

Under the influence of mescaline, the leading material was an hallucination of the sister with a dagger in her heart, and covered with blood. She also saw many accusing eyes and heard voices accusing her of killing her sister. Later, the patient denied this, protested she loved her sister but that the sister had stolen her husband. Throughout mescalinization, the obsessive-phobic syndrome was not evident.

This material was previously unconscious and may also refer to the triangle with her parents as well as with the husband and sister. This woman selected one specific phase of one of her several conflicts for no clear or predictable reason.

Despite the high frequency of visual hallucinations under the influence of mescaline, there was little resemblance between these and the manifest content of previously reported dreams. Most of the visual phenomena were relatively nonspecific, including a variety of ever-changing, geometrical patterns. There was no evidence to suggest that these forms were particularly meaningful, though some were secondarily endowed with affect, nor were they repetitions of dream symbols.

C. Recall of Past. Infantile Experiences. This material was classified according to: (a) memories previously reported, and (b) those not available in the drug-free state. The incidence of each type of material in the three groups of patients was as follows: Group I, 17 patients: a-6; b-6; a and b-3. Group II, 26 patients: a-5; b-2; a and b-2. Group III, 16 patients: a-0; b-0.

Memories of previously reported material and newly recalled memories are best illustrated by considering certain details of 2 specific cases. Possible dynamic connotations can then be commented upon and some observations on screen memories can be given.

Case 3.—A 34-year-old man with an eight-year history of phobias, diffuse anxiety and depression, as well as bizarre ideas about the horrible appearance of the right side of his face. Feelings of genital inferiority, fears of sexuality with women and fascination with homosexualty also obtained. He had lived with an alcoholic, ne'er-do-well father who showed some affection, and with a carping, increasingly psychotic mother, until the age of five, when both parents were institutionalized and he was sent to

an orphans' home. He spontaneously anticipated the mescaline experience with much optimism, hoping it would cure him. Afterward, he said he had relived his childhood from three to five.

Under the influence of mescaline, he was attending the circus with his father, seeing the animals and alternately enjoying himself and being frightened by the animals. He carried on a conversation with his father, expressing much enthusiasm about the circus, alarm at seeing the snakes and fearful concern that the monkeys were laughing at him. In the midst of this, he said: "Oh God, I have to go to the bathroom. I wet the bed. I'm sorry, Dad." He made several references to his having the anatomic structure of a girl. Later in the day, he stated he used to go to the circus with his father, though this had never been mentioned during a long period of psychotherapy. Most of his drug-free memories about his father were condemnatory and disdainful. He made no reference to mother, playmates, orphanage or foster homes during the mescaline experience.

There is a dream-like quality to the circus experience with oscillations between frightening elements and fairly simple, wish-fulfillment scenes. His retrospective comment that he had relived his life from ages three to five is an exaggeration. The mescaline material might be looked upon as a condensation of his personality problems with particular reference to his concept of himself, body image, ambivalent relationship to father, and his fearful, rejecting attitude toward women, who were seen as threatening, ridiculing, dangerous animals, prototypically the mother. To believe that all of this dynamic material was included is open to question, and a number of the other aspects of his personality structure were not evident. As noted above, this crystallization of content under mescaline was new, though the dynamics were reasonably clear before mescaline.

Case 4.—A 32-year-old man who had a five-year history of phobias, depression, paranoid attitude, and marked anxiety. As a child he had feared being alone. His mother died when he was five and when he was lifted to kiss her in the coffin, he screamed. Subsequently, he had fears of coffins, of being buried, and feared the stove legs because they reminded him of coffin legs. At five or six, he saw a playmate with his clothes on fire and believed the child subsequently died because he saw a wreath on the door.

During the mescaline experience when he was left unattended, he recalled his childhood fear of being alone. He saw his mother's coffin with her relatives and other people crying at the funeral. Then he became quite indignant and said that these people were dirty bastards for they had not really come to the funeral. He was reminded of death on several occasions. Frequently he reported smelling smoke though there was none in the room and one or two occasions he saw fire. This reminded him of the boy with his clothes on fire.

The drug-free memories of his mother in the coffin and the playmate burning to death may be screen memories. The death of the mother and the attendant events were obviously of great importance in view of the stove and coffin-leg phobias and the memory of screaming when he was lifted to kiss his mother in the coffin. Under mescaline, he elaborates on this—observing the sad funeral scene with many friends and relatives mourning his mother's death. The sudden emotional shift to vindictive anger over their actual absence suggests the impotent rage he felt in his helplessness and loneliness at her death. After the mother's death he was placed in an orphans' home. The father removed him from the place two years later, but committed suicide shortly thereafter. The memory of seeing the child on fire when he was five or six recurred frequently in the drug-free state and was recalled under mescaline, during which he smelled smoke and saw fire. A pre-mescaline dream of an older brother lying on a couch and burning to death and other memories of fire suggest marked preoccupation with this topic. The brother, who resembled the father, had beaten the patient when he was small. The fire preoccupation may be associated with guilt feelings concerning the death of the mother, later of the father, with punishment by burning.

D. Emotional Responses. Transference Phenomena. There was no evidence of any correlation between anticipatory responses to receiving mescaline and the productivity or co-operation during the mescaline experience. The majority of patients in all three groups were apprehensive, but in general co-operative. Patients were persuaded to take the drug and those who refused did not receive it. About 25 per cent of the patients were hostile, resentful during the initial stages, and some of these were resistive while others submitted resignedly. One patient in Group II and several in Group III were blandly indifferent, as they were to most external events. Two of the patients in Group I spontaneously expressed great optimism, anticipating a remarkable therapeutic effect with mescaline (Cases 3 and 4.).

During the mescaline experience, the outstanding emotional reaction was one of anxiety, the determinants and discussions of which are given in other papers (4, 8). Several of the patients, especially in Groups I and II begged not to be left alone even briefly. The presence of a psychiatrist or nurse had a markedly reassuring effect, apparently a nonspecific wish for a parent figure. Often there were whimpering pleas to have the experience terminated. These fears were most extreme in a 29-year-old woman with obsessive-phobic, anxiety and depressive symptoms who wished to be held in the nurse's arms and who held and kissed the nurse's hand. She screamed for help if left alone for a minute.

Three quarters of the patients in Group I, half of those in Group II, and a quarter of the patients in Group III showed some degree of hostility and anger. In most, this was an extension of the same sort of reaction in the drug-free state. In some it was characterized by sullen resentment with refusal to report experiences, veiled or direct sarcasm, vindictive remarks, and threatening demands that the drug action be terminated. In others there was a more active display evidenced by shouting, upsetting furniture, minor and rarely major assaultiveness. In these patients, a definite paranoid trend often obtained with suspiciousness, ideas of reference or persecution.

Case 5.—A 25-year-old housewife with obsessive-compulsive symptoms cried, pleaded, cursed the psychiatrist for giving her the drug, and slapped the face of a resident psychiatrist. After recovery she volunteered that she had made a fuss in order to persuade the psychiatrist to give a counter-injection. All this was in some contrast to her drug-free behavior, which was characterized by sullen aloofness and occasional sarcastic remarks.

Other examples of such contrast between drug-free and mescaline behavior are noted in the case extracts above.

There is little evidence of specific object displacement in the mescaline experience. The psychiatrist is recognized as the powerful person who gives the drug, who wishes to record the patient's experiences, and who can relieve the patient of the effects of the drug. Two patients in Group I and 2 in Group II hallucinated or called for one or both parents and conversed with them. This is well illustrated in Case 3.

Under mescaline there are many emotional reactions to the experience and to personnel. The patient's positive feelings for the psychiatrist in the drug-free state are temporarily jeopardized because of the psychiatrist's role in making the patient uncomfortable. Drug-free feelings of hostility are often increased under mescaline. In some instances the patient does not need to transfer his feelings or displace the object of his feelings for the parent is present in the experience. The parent is seen in the hallucinations.

E. Flow of Associative Material and Ego Defense Mechanisms. A few of the patients held themselves aloof from the mescaline experience, a typical response being that seen in a woman, a Greenwich Village artist, who reported her visual experience as if she were conducting a tour through a museum. In some there was an admitted refusal to report anything but gross physical discomfort and many were obviously selective in their reporting. Frank blocking was of fairly common occurrence in a majority of patients at one time or

another. Some volunteered having difficulty in describing their experiences, there seeming to be no adequate words in the usual vocabulary. However, neologisms were infrequently noted and were seen mostly in the deteriorated schizophrenic patients (III) in whom they were not uncommon in the drug-free state. In a majority of those who verbalized reasonably well, it was often reported that perceptions were changing so rapidly that accurate description was impossible. A relatively free flow of mental content was approximated in about half of the pseudoneurotic group and about a third of Group II. Examples of the extent to which content can dominate a patient and still be satisfactorily reported are seen in some of the case extracts given above.

The ego defenses are weakened and simplified during the mescaline experience. The patient is aware of much more frank and acute anxiety. There is evidence of release of some previously repressed material in a number of patients in Groups I and II, especially among those rated "High" in Table I. Social and sexual behavior were much less inhibited in several of the patients. A number of the patients invoke the partially conscious defense of suppression in an effort to deal with newly appearing, anxiety-laden material. Much of the elaboration of material represents an expansion of previous condensations as illustrated in the case extracts. The emotion which is usually focused on neurotic symptoms and mental content is often displaced to somatic discomfort.

The perceptual phenomena during mescalinization, especially the visual hallucinations, are of two different varieties. The constantly changing, colored geometric patterns and simple formations are probably entopic phenomena (6), and are not to be considered as meaningful symbols. The other type, examples of which are given above, may be looked upon as elucidating previously unconscious material in some instances. Content which is repressed, condensed, and displaced in the drug-free state is expressed more straightforwardly. The erotic wishes are in evidence, the parents are present in hallucinations, and the hostile impulses are carried out in the hallucinations.

Regressive phenomena were noted in several of the patients in Groups I and II, including crying, thumb-sucking, screaming, helpless pleading, and hand-kissing. To what extent such regression represents ego defense in the usual sense or a release phenomenon could not be determined. Both simple and pathologic projection (delusional formation) were commonly observed, as were dissociation and denial. These data have been commented upon in other communications (3, 5). Isolation, undoing, and atonement were rare as new defense mechanisms in a given patient, and usually were absent from obsessive-phobic patients who had employed them extensively in the drug-free state.

Discussion

There has been some discussion in the literature concerning drug-specific versus personality-specific responses to various noxae, especially to mescaline (1, 7, 8, 9, 10, 11). In a consideration of mescaline hallucinations, Klüver (6) makes some discerning comments on the possibility of their having affective determinants and of their meaningfulness to the patient.

Theoretically one can differentiate (a) nonspecific perceptions which are essentially neutral, or which elicit a primitive type of fear or pleasure response; and (b) those which are specific to the patient, being quite meaningful to him and involving his whole personality. The first type usually occur as monotonous repetitions or as unorganized, fragmented perceptions, while the latter are usually little dramas or complex scenes of lifelike nature. Actually it is not possible to achieve this nice differentiation. One can often discover some personality-specific responses, as was done with the present material, in which percept and concept center about a certain theme.

Among the nonspecific mescaline responses, on the perceptual-verbal level, there are many similarities among the patients' responses and some dissimilarities. One may say that the latter are individually determined, if "personality" is considered in the broadest sense. To date, there has been insufficient investigation of these to warrant any conclusions.

Given the personality-specific mescaline productions, it is possible to see the association between this material and the drug-free personality structure. Even those clinical and dynamic trends that were unrecognized or unemphasized prior to mescaline can be seen as consistent with the personality of the patient. Only rarely was such material considered somewhat alien by the patient. However, it is not possible to predict the dynamic material upon which the patient will concentrate during the mescaline experience. Even though some of the basic personality manifestations are discernible in successive mescaline experiences, the predominating material is different in successive interviews.

The therapeutic value of the isolated mescaline experience has been emphasized by other workers (1, 10). In our material some release of formerly repressed ideation and affect was noted, but this was fragmentary, unpredictable, and did not prove useful to the patient. The fact that the patient was dominated by the physiologic and psychologic effects of mescaline with attendant anxiety and often with reactive hostility, tended to impair the establishment and maintenance of rap-

port with the therapist, frequently neutralizing positive feelings which had prevailed in the drug-free state. The nature of the mescaline situation precluded the development of transference phenomena in most instances, thus obviating the possibility of analyzing these. Aside from accepting gross reassurance, the patient was not accessible to the therapist. The usual drug-free defense mechanisms and resistances were altered in the direction of simplification. Therefore, analysis of these, even if possible, might not be particularly pertinent.

Mescaline has a profound effect on the psychodynamic material. It presents us with a technique for investigating personality structure and further exploration is required. However, its usefulness is definitely limited by the artificial aspects inherent in the mescaline experience. There is no indication that it can serve any useful therapeutic end as employed in the present study.

Summary

This paper deals with the relationship of productions during mescaline intoxication to psychodynamic material obtained in drug-free psychotherapeutic sessions. The 59 patients in the study include 17 with pseudoneurotic schizophrenia (Group I), 26 with more overt schizophrenia, but without deterioration (Group II), and 16 deteriorated schizophrenic patients (Group III). It was found that the pseudoneurotic group was more accessible to study both in the drug-free and the mescalinized states, while the deteriorated schizophrenics were least accessible. Confirmation or elaboration of dynamic material obtained in the drug-free state was relatively common in mescalinized patients in Groups I and II while confirmation of dream material occurred less frequently and the appearance of new material was noted in only half of the patients in Group I and a quarter of Group II. The findings in Group III were minimal with reference to these types of data. The ego defenses are weakened and simplified during mescalinization and the patient is aware of much more frank and acute anxiety. Social and sexual behavior is less inhibited. Much of the elaboration of material represents an expansion of previous condensations. Displacement of affect from usual content to somatic discomfort was frequently observed. The mescaline hallucinations include definite scenes which appear to be specific to the patient's personality and contain material which had been condensed, and repressed in the drug-free state. The present study suggests that mescaline has a definite effect on dynamic material and presents a useful technique for investigating personality structure. Its value in therapy is not evident at the present time.

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THE SURGICAL TREATMENT OF THE CEREBROVASCULAR ACCIDENT

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For the purpose of this article, cerebrovascular accident will mean frank hemorrhage into the brain, cerebrovascular thrombosis, or subarachnoid hemorrhage. The author's experience with the surgical procedures used in the treatment of these conditions will be set forth. By surgical procedures, we mean craniotomy with evacuation of cerebral clot, stellate ganglion novocain and alcohol blocks, cervical sympathectomy, and lumbar puncture.

Frank cerebral hemorrhage due to hypertension is easily diagnosed from the history and physical findings. The patient is usually a known hypertensive. However, even if the physician is seeing the patient for the first time, he will find him or her to be hypertensive. In addition, there will be some degree of pararlysis and diminished consciousness, depending on the extent and situation of the cerebral damage. In the region of the internal capsule, moderate hemorrhage will cause a hemiparesis with confusion and disorientation. If the bleeding has taken place on the left side in a right-handed person, a motor aphasia will accompany the paresis. In a left-handed person, a lesion in the right internal capsule may cause a motor aphasia. The patient can be treated by conservative methods for the most part. One spinal tap should be done and no more than 10 cc. of cerebrospinal fluid should be removed for analysis for protein content, cells, sugar, chlorides, and Wassermann reaction. Intracranial pressure should be taken with a water manometer. No form of compression test, such as the Queckenstedt should be performed. Lumbar puncture serves the following purposes: (a) it lowers the blood pressure; (b) it lowers intracranial pressure; (c) the pressure reading and fluid analysis give valuable information as to the possibility of neoplasm, infective state, or lues.

The second step in treatment is restriction of fluids to 1500 cc. in 24 hours. The fluid should contain 5 per cent glucose in 500 cc. of normal saline and 1000 cc. of normal saline with 500 mg. thiamine chloride, if the patient has to be fed by vein. The reason for restricting the amount of sugar is that I have found 16 out of 28 patients have shown evidence of hyperglycemia after cerebral hemorrhage. One case, a severe hypertensive intracerebral hemorrhage, showed a blood sugar of over 400 mg. per cent one day and 540 mg. per cent the following day. There-

fore, if the patient shows an increased blood sugar, this should be controlled by adequate insulin. This hyperglycemic state may last for months.

Further steps in treatment are small amounts of digitalis for support of the heart; atropine, gr. 1/150, twice daily by hypodermic injection, for control of pulmonary secretions; Vitamin B complex and Vitamin C in adequate doses by injection daily. The patient should be turned from side to side every hour. Usually, the patient is incontinent and so catheterization is not necessary.

Within 24 to 48 hours, cerebration should be improved. The paresis should be less and the hypertension in many cases will gradually improve, so that the blood pressure comes down to normal limits for diastolic as well as systolic pressure.

If after one week, the paresis shows slow progress toward improvement, stellate ganglion novocain and alcohol block can be done on the side of the cerebral lesion. This procedure should not be carried out before one week has passed. If two weeks have passed after the stellate ganglion block and progress toward normal function of the paralyzed limbs is still slow, then a similar block should be done on the other stellate ganglion. This will, usually, cause marked improvement in the involved limbs.

Two interesting facts have been observed by the writer after bilateral stellate ganglion block with novocain and alcohol. First, within 48 hours the bilaterally constricted pupils become semi-dilated. I have also found this to be so following my operation for essential hypertension, which consists of bilateral cervical sympathectomy. The second phenomenon is a fall in blood pressure which is gradual in its decline and persistent in its status.

I have found stellate ganglion block to be of value in cases of pararlysis due to cerebral hemorrhage which had occurred five years before treatment. While in most cases there is definite improvement in the paralyzed limbs, this improvement is by no means miraculous or dramatic in its appearance. It is, rather, a slow but definite progress. Stellate ganglion block should not be done before a week has passed since the onset of hemorrhage. In more severe cases, two weeks should elapse before this form of treatment is atempted. Physiotherapy can be instituted one week after mild cerebral hemorrhage or cerebrovascular thrombosis and the patient can be allowed out of bed for short periods at this time. Diet should consist of puréed foods, and the bowels are to be kept open by an occasional mild purge.

Cerebrovascular thrombosis of a minor vessel will ape mild cerebral hemorrhage, except that the patient is usually a hypotensive and there

is rarely any loss of consciousness. The treatment of the patient who has suffered from thrombosis of a cerebral vessel is essentially the same as that for one who has had a moderate cerebral hemorrhage.

The person who has suffered from subarachnoid hemorrhage will react in one of three ways, depending on the severity of the bleeding. He may die within a short time of the onset of the hemorrhage. The patient may go into coma and exhibit many of the signs of cerebral irritation, such as cervical rigidity, rise in temperature and pulse rate, and, occasionally, convulsive seizures. Or he may remain conscious and complain of severe headache. Sometimes there is severe pain down both lower limbs similar to a bilateral sciatic syndrome. This is due to drainage of blood into the caudal sac. Spinal puncture will show blood-stained cerebrospinal fluid. The fluid may vary from a slight pink to frank blood. This blood-stained fluid is highly irritating to the meninges and nervous tissue.

The mainstay of treatment is repeated spinal puncture. In serious subarachnoid hemorrhage, the cerebrospinal fluid should be withdrawn slowly in 10 cc. amounts every 12 hours. These frequent lumbar punctures are often life-saving and have the advantage of reducing the patient's head pains. These spinal taps should be done until the fluid is clear of blood. I have never seen these frequently repeated lumbar punctures cause an exacerbation of the bleeding.

It has become a common procedure to perform cerebral angiography in an attempt to find the cause of bleeding, and when the vessel which is the source of hemorrhage is found, the internal carotid artery on that side is gradually occluded on the premise that the interarterial pressure is reduced. This is not a logical procedure since a normal head of pressure will be brought to the involved area through the circle of Willis. If this were not so, the area of brain deficient in blood would become necrotic. It is only when the vascular supply is ample that no cerebral changes take place. Therefore, in my opinion, carotid ligation is not a logical procedure.

All other treatment for subarachnoid bleeding due to hypertension is the same as for moderate cerebral hemorrhage with the exception of frequent lumbar punctures in subarachnoid bleeding.

Massive cerebral hemorrhage and thrombosis of a large cerebral vessel will give a similar clinical picture. The only difference is that the case of the frank bleeding is associated with hypertension. The patient is seriously ill. He is in deep coma and cannot be roused. There is a complete paralysis of the face and limbs on one side of the body. The pupils are unequal. The pupil on the side of cerebral damage is first constricted and then dilated, and will react to light sluggishly, or

not at all. If both pupils are dilated and do not react to light, the prognosis for recovery of consciousness is nil. The pulse is at first slow and bounding with a high pressure. The pulse rate will gradually increase until it reaches over 120 per minute. At this time, the pupils will both be sluggish in reaction and may be constricted or may both be dilated. Respiration will be labored and will gradually tend toward the Cheyne-Stokes type of breathing. Temperature will begin to rise and will gradually reach 105° F. This stage is one in which the medulla has become irreversibly edematous and the patient will not recover.

Nevertheless, some of these patients can be saved if the problem is attacked quickly and courageously. In my practice, I have had an opportunity to operate on 10 cases of severe cerebral hemorrhage due to hypertension. Of the 10 cases, 2 patients are alive today. One patient has some minimal residual paralysis and the other patient is almost completely without objective evidence of her previous cerebral hemorrhage. Both patients have normal systolic and diastolic blood pressure since the cerebral clot was evacuated and bleeding controlled. It is impossible to tell which patient can be helped, and two lives saved out of ten are two more than were previously aided by conservative measures, for I have in mind the massive cerebrovascular hemorrhage or cerebrovascular occlusion.

Certain points must be kept in mind. Operate on the patient while at least one pupil is reacting to light and before the pulse has reached 120 per minute. If the pupils do not react to light and the pulse is over 120 per minute, surgery will be useless.

As evidence that one cannot tell which patient will be saved by surgery, two similar cases will be described in which one patient lived and one died.

Case Reports

Case 1.—A female in her middle forties who was receiving outpatient treatment for hypertension in one of our hospitals was brought in by ambulance. The story was that she fainted in the subway and fell to the floor. In the hospital, her husband volunteered the information that she was undergoing treatment for hypertension. The patient was seen within an hour of admission and at that time her pulse rate was 60 per minute. She was in deep coma, her pupils were unequal, the righ pupil was smaller and did not react to light, and the left pupil did react to light. The patient showed a complete left hemiplegia and could not be roused. Her temperature was beginning to rise. In addition, she showed severe cervical rigidity. Spinal tap showed blood-contaminated cerebrospinal fluid. It was thought that the patient had ruptured a vessel in the region of the right internal capsule and had sustained additional injury when she fell.

At operation, I found epidural clot (minimal), subdural clot (moderate), and a massive clot intracerebrally which began to push its way through the edematous brain soon after the dura was opened. The clot was removed and fresh bleeding from the ruptured vessel was controlled. The dura mater was left open and no drains were inserted; the temporal muscle was sutured with separate silk sutures but the fasia was not repaired. The scalp was repaired by one layer of separate silk sutures and the patient was returned to bed. Spinal puncture was carried out twice daily and then daily until the cerebrospinal fluid was clear of blood. Antibiotics were given for treatment of a pyelitis. Postoperative treatment in general was as outlined at the beginning of this article.

The paralysis and aphasia gradually disappeared, the blood pressure within 10 days was within normal limits and has remained so since operation. The patient is better now than before the cerebral accident. It seems that some hypothalamic pressor center is brought into normal function when one of these intracerebral clots is removed.

Case 2.—A retired policeman, aged 69 years, had a cerebral hemorrhage, fell to the ground and sustained a fractured skull and an epidural hemorrhage. Significant clinical signs were: Deep coma with left hemiplegia, slow pulse, slight elevation of temperature, unequal pupils, with the right smaller than the left and the left pupil reacting to light. At operation, an actively bleeding, middle meningeal vessel was found and upon opening the dura mater and exposing the brain an artery was seen to be bleeding profusely in the region of the internal capsule. All bleeding was controlled, and the dura was left open. The temporal muscle was repaired in one layer by separate silk sutures; temporal fascia was not repaired, no drains were used. The skin was repaired in one layer by separate silk sutures.

This patient developed a hyperglycemia which reached 540 mg. per cent of sugar on the day before death.

Except for difference in age, these 2 cases were similar in operative findings, yet one lived and one died. It is only by attempting surgical attack, under the conditions described above, that some lives can be saved that would otherwise be lost.

Summary and Conclusions

1. Unilateral, or bilateral, stellate ganglion block is of value in helping the cerebrovascular paralytic to recover from his paralysis.

2. The pupils of the patient who has had a bilateral stellate ganglion block show a recovery from Horner's syndrome within 48 hours, and the blood pressure will come down to normal limits within two weeks. This was observed in 19 out of 28 cases.

3. Hyperglycemia was observed in 16 of 28 patients after cerebrovascular accident. These people had no evidence of diabetes mellitus

before the "stroke." This hyperglycemia may persist for months and should be treated by insulin and diet.

4. The severe cerebral hemorrhage should be attacked surgically, the clot evacuated, and the bleeding controlled. This can be done through a subtemporal approach and can be accomplished within 60 minutes.

5. The case of severe cerebrovascular thrombosis should be treated like frank hemorrhage, with decompression of the brain and suctioning out of necrotic cerebral tissue.

6. Subarachnoid hemorrhage responds well to frequent lumbar punctures and carrying out this procedure every 12 hours helps the patient immensely. No more than 5 or 10 cc. of cerebrospinal fluid should be removed at a time.

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CLINICAL EFFECTS OF A "STIMULANT" BARBITURATE

(Sodium 1:3-dimethylbutyl ethyl barbiturate) in Schizophrenics

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Many barbiturates stimulate rather than depress the central nervous system in experimental animals but clinical evaluation of these drugs has been limited (15). Administration of a central-depressant barbiturate such as sodium amytal often produces transient amelioration of different symptoms in schizophrenics (6, 10, 3). These symptom changes are usually attended by a variable degree of hynotic (sleep-producing) effect which may proceed to actual sleep as the dosage is increased. In the drug therapy of schizophrenics the excessive narcosis produced by the central-depressant action of the barbiturates in common usage limits the total dosage which may be conveniently administered. It was considered possible that a central-stimulant barbiturate might possess the desirable therapeutic activity of the ordinary depressant barbiturates without the disadvantage of excessive narcosis.

The stimulant barbiturate utilized to test this hypothesis was 1,3-dimethylbutyl ethyl barbiturate, sodium salt (15), (hereafter designated as DMBEB) which is similar structurally to sodium amytal (14). A small number of observations has also been included on another stimulant barbiturate, namely, 3,3-dimethyl allyl ethyl barbiturate, sodium salt, (supplied for research purposes by Eli Lilly and Company, Indianapolis) (16). According to reports, DMBEB produces a period of increased alertness and restlessnes in unanesthetized dogs, followed by convulsions; the seizures, which occur only in warm-blooded animals, are violently tonic in type and the locus is probably the spinal cord; no hypnotic or anesthetic effects are noted in sublethal doses (13, 14,). The reflex contraction of m. tibialis anticus is augmented in spinal and barbital-anesthetized dogs; in this regard it is 1/250th as active as strychnine, one-fourth as active as picrotoxin, and more active than caffeine, cocaine, or ephedrine (9). The crossed-extension reflex in m. gastrocnemicus and respiration are also augmented (8). The convulsant activity of DMBEB may be antagonized by administration of sodium amytal (14). The sodium salt of 3,3-dimethyl allyl ethyl barbiturate produces a restless, frightened, or boldly vicious animal in which con-

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vulsions finally ensue; blood pressure and body temperature rise while respiration is stimulated (16).

Gottlieb has previously observed that DMBEB produces a euphoric effect in depressed patients after oral administration in subconvulsant doses (4). The drug was likewise maintained at a subconvulsant level in the present study in order to rule out the possible therapeutic effect of a generalized seizure.

Procedure

Patients.—DMBEB was administered to 20 hospitalized schizophrenics, 8 males and 12 females. Mean age was 32.5 years; mean duration of illness, 13.4 years; mean duration of hospitalization, 2.2 years. The diagnostic categories were as follows: pseudoneurotic, 6; catatonic, 2; hebephrenic, 1; mixed or unclassified schizophrenic, 11. The pseudoneurotics presented diffusely neurotic symptomatology in a basically schizophrenic setting and were diagnosed according to the criteria of Hoch and Polatin (7). The group of mixed and unclassified schizophrenics presented admixtures of catatonic, hebephrenic, and paranoid components as well as the primary features of the disease. Gross catatonic stupors or excitements and diagnostic categories other than schizophrenia were not included. Most of the patients were quite well preserved. Sixteen of the 20 cases had either no or slight deterioration (6 pseudoneurotics, 2 catatonics, 1 hebephrenic, and 7 mixed or unclassified schizophrenics); these patients were chiefly short-term, voluntary hospital admissions. The remaining 4 subjects displayed an advanced degree of schizophrenic deterioration and were long-term, state hospital patients. All but 2 patients had received at least one course of electric convulsive and/or insulin coma therapy at some time during the course of the illness.

Drugs.—DMBEB was dry-sterilized in an electric oven at 150-160° C. for one to two hours. Immediately prior to intravenous injection the drug was dissolved in 20.0 cc. of sterile distilled water at a concentration of 5.0 mg. per cc. A colorless solution was quickly formed. The average dose of DMBEB that was administered was 63.5 mg. in the 20 subjects. An injection rate of about 5.0 mg. per minute was used in all subjects. The same procedure was followed in the administration of 3,3-dimethyl allyl ethyl barbiturate, sodium salt, to 2 patients both of whom also received DMBEB on another occasion. Each patient also independently received intravenous injection of sodium amytal (Amobarbital sodium, Eli Lilly and Company, Indianapolis), 250-500 mg. dissolved in 10.0 cc. of sterile distilled water at a rate of about 50 mg. per minute, as well as 20.0 or 40.0 mg. of pervitin hydrochloride (Smith,

Kline and French Company, Philadelphia) in 2.0-4.0 cc. of solution in one minute. Six patients also received intravenous sodium amytal in the same dosage and rate of administration as that of DMBEB. The drugs were administered in random orders to the various subjects. Injections were performed between 8:00 A.M. and 4:00 P.M. without limitation of food or the subject's usual ward activities. Changes in the patient's baseline clinical status were recorded in protocol form for a period of at least 48 hours following injection.

Results

I. *Mental Reactions.*—DMBEB reduced clinical symptoms in 11 (55.0 per cent) of the series. Three patients (15.0 per cent) showed only increase of symptomatology and 6 (30.0 per cent) had no reactions except for side-effects to be described in section II.

A. *Symptom-reducing effect.*—The therapeutic action was most pronounced in the pseudoneurotic group. Four out of 6 patients in this group experienced complete or almost complete relief of anxiety and tension, phobic concerns, irritability and hostility, and depressive manifestations. All 3 obsessive-compulsive patients in this group experienced amelioration of the disabling symptomatology, slight in 1 and quite complete in 2. The usual duration of relief was two to eight hours, but in 2 subjects the improvement lasted 16 to 24 hours. The symptomatic improvement began during the injection, usually concurrently with cephalic sensations described variously as "light-headed" or a "subtle feeling of relaxation." In the 14 overt schizophrenics (hebephrenics, catatonic, mixed, and unclassified), 7 patients showed slight to moderate therapeutic responses which were in general less complete than those of the pseudoneurotics. The effects in the overt schoziphrenic group consisted principally of signs of personality reintegration with more normal emotional feeling and display, less self-concern and self-preoccupation, an increased tendency to contact the environment, and a somewhat higher verbal productivity. The most deteriorated cases responded least to the drug in a therapeutic sense; these patients also responded least to sodium amytal and pervitin.

These therapeutic responses to DMBEB were qualitatively identical with those often produced by central-depressant barbiturates. However, the therapeutic response to DMBEB was more complete than to sodium amytal administered in the same low dosage to 6 patients (30, 50, 65, 89, 100, and 100 mg.); this was particularly true in the pseudoneurotic group. Moreover, clinical signs of hypnosis with DMBEB occurred in only 4 patients in the series and consisted of transient drowsi-

ness and a sleepy expression; slurred speech, nystagmus, excessive euphoria, and other signs of acute barbiturate intoxication were not present. Some of the most completely relieved subjects reported no feelings of drowsiness and displayed no objective signs of such after DMBEB. In addition, DMBEB produced none of the signs of psychic "stimulation" that usually occurred after pervitin, a cephalotropic sympathomimetic amine. Administration of pervitin was almost invariably attended by a positive "stimulation" aspect consisting of increased alertness and energy, feelings of optimism, and heightened psychomotor activity. In patients responding therapeutically to DMBEB, the action may therefore be summarized as a symptom neutralization or elimination without concomitant "stimulation" and, as described above, with occasionally a minor degree of sedation.

B. *Symptom-increasing effects.*—Symptom intensification occurred in 3 patients as follows: one subject wept copiously, felt sorry for himself, and complained bitterly of mistreatment by doctors; a second subject had a brief, opisthotonic seizure of hysterical origin identical with the type occurring in the drug-free state; the third subject felt more perplexed, confused, and depressed. These reactions were all exacerbations of pre-existent manifestations which had also previously increased spontaneously or in response to amytal and/or pervitin. These excessive reactions appeared to be precipitated "psychologically" as a secondary reaction to the unusual side effects produced by DMBEB (see Section II). None of these subjects showed signs of acute barbiturate subnarcosis. In addition, the reactions did not entirely resemble the exaggerated emotional discharges so often produced after pervitin, since none of the primary "stimulation" effects of pervitin on psychomotor processes was present.

C. *Absent mental reactions.*—Six patients (30.0 per cent) had no reactions to the drug in terms of pre-existent symptomatology. In 3 of these, the side-reactions to the drug were so intense that the patients were preoccupied with little else. In the 3 other subjects, there were no mental changes of significance despite the absence of considerable side-effects.

II. *Side Reactions.*—Practically all (18 out of 20) patients experienced side-reactions. The toxic effects appeared during the injection and the sequence of events was approximately the same in the majority of subjects. Tingling sensations or other paresthesias began in any part of the body, and rapidly became pruritic in nature; this was followed by or associated with hot and cold sensations and a mottled erythema in face, chest, and trunk. Pilomotor reactions often appeared on arms

and back; less frequently there were feelings of vague abdominal discomfort or slight nausea; repeated, forceful sneezing; and occasionally burning of the eyes. Cephalic sensations previously referred to (Section IA) usually began early in the injection in a small minority of subjects; on assuming the erect position some patients complained of a vague vertigo of nonspecific nature and minimal degrees of ataxia were observed.

The maximum dosage of DMBEB that could be comfortably tolerated by the subjects was limited by the pruritis, which was the most frequent side-reaction (18 out of 20 patients). The itching usually began in scalp, face, eyes, soles of feet, or genital areas. Spread was rapid and in some cases the pruritis became generalized; some subjects rubbed and scratched vigorously and became extremely distressed, tending to disregard the other actions. All the side-reactions enumerated above were of relatively short duration, usually subsiding in 10 to 30 minutes. In some cases, the pruritis persisted for several hours, although distress was always minimal after the first 10 to 30 minutes.

In 17 cases, the injection was discontinued when the above reaction definitely appeared, particularly the pruritis. The average dosage administered to these subjects was 64.4 mg. total or 1.01 mg. per Kg. of body weight. The threshold dosage for the appearance of any effect, mental or toxic, was in the neighborhood of 30.0 mg. The range of effective therapeutic dosage without toxicity was therefore quite narrow. Two patients received full dosage of 97.0 and 101.0 mg. total without side-effects and a marked symptomatic improvement in one.

Two subjects displayed seizures at dosages of 59.0 mg. (0.65 mg. per Kg.) and 68.0 mg. (1.04 mg. per Kg.), although other subjects receiving equal or larger dosages did not display seizures. The involuntary movements were of a jerky, nonrhythmic myoclonic type; in one subject the movements were more or less generalized and in the other limited to the right arm. The movements occurred in cycles of about 15-20 seconds duration for a period of about 10 minutes. Consciousness was not impaired during the seizures; deep reflexes were normal in the interseizure phases; there were no facial weakness, pupillary changes, nystagmus, Hoffman or Babinski reflexes. The seizures appeared in these two subjects after the itching had become severe and generalized. Continued experience with the drug showed that no patient developed a seizure if the injection was discontinued at or shortly after the appearance of the pruritis.

None of the side-effects of DMBEB occurred after sodium amytal with the exception of its quite minor hypnotic action. Pervitin side-effects were totally distinct, consisting usually of mouth and throat

dryness, peripheral numbness and lightness, chest pressure, and cephalic tightness or aching.

Sodium 1,3-Dimethyl Allyl Ethyl Barbiturate.—This stimulant barbiturate was administered in doses of 1.26 and 1.37 mg. per Kg. to 2 subjects. The same side-effects were produced as with DMBEB and with the same apparent intensity. One subject experienced generalized myoclonic-like twitchings. No therapeutic effect on mental symptomatology was observed.

Discussion

DMBEB has been classified as a "stimulant" barbiturate in animals in the experimental pharmacologic literature because of its convulsion-producing property and augmentation of spinal reflexes (13, 14, 8). The epileptogenic action was confirmed in this clinical assay of the drug inasmuch as 2 subjects had seizures under the drug, the dosage being maintained at the subconvulsant level in the other patients. The seizures occurring in these 2 subjects were of myoclonic type, whereas Swanson and Chen reported that the drug produced severe convulsions of tonic type in laboratory animals (14). This difference as to type of convulsion may be a species difference or reflect the limitation of dosage in man. The median convulsant dosage after intravenous administration to guinea pigs, rabbits, cats, dogs, and monkeys ranged from 2.0-3.0 mg. per Kg. body weight (14), whereas the brief myoclonic episodes with DMBEB in this series occurred with dosages of 0.65 and 1.04 mg. per Kg.

The numerous side-reactions observed in man have not been reported in animals; some of these side-reactions are purely subjective and therefore not observable in animals. Knoefel found that DMBEB produced a stage of increased alertness and restlessness prior to the seizures (8); dogs under sodium 1,3-dimethyl allyl ethyl barbiturate became restless and also appeared frightened or boldly vicious prior to the onset of convulsions (16). These apparent changes in emotion and behavior in animals could have been secondary to a highly distressing action such as occurred in man, mainly the severe paresthetic and pruritic response. Either a peripheral or central locus of action might underlie the typical constellation of tingling, burning or cold, pruritis, pilomotor contractions, erythema and sneezing. The sneezing in man may be analogous to the respiratory augmentation observed in animals (16). Gottlieb noted that the toxic reactions to DMBEB in man were not significantly affected by administration of antihistaminic drugs (4).

Despite the motor stimulation caused by DMBEB in man and reported in animals, there was little or no evidence that the drug acted

as a "psychic stimulant" in patients. The term "psychic stimulation" in man is generally applied to the exaggerated emotional and behavioral phenomena of subnarcosis as with intravenous sodium amytal, or to the "primary" heightening of mood or psychomotor processes, as with the cephalotropic sympathomimetic amines. Neither of these types of reactions occurred after DMBEB. In this respect the drug may be grouped with such agents as metrazol and strychnine which are potent convulsants but relatively weak "psychic stimulants." The absence of obvious signs of "psychic stimulation" with DMBEB in man may be associated with the fact that the seizure locus in animals is apparently the spinal cord (14).

Although DMBEB has been reported to have no hypnotic or anesthetic effects in animals (14), a weak hypnotic effect was observed in the minority of the patients of the present series. This difference may reflect species variation or technical limitations in animal experimentation inasmuch as a slight degree of narcosis is often purely subjective.

From the therapeutic point of view, DMBEB produced symptom amelioration in 11 out of 20 or 55.0 per cent of the series; the effects were most complete in pseudoneurotic schizophrenics. Gottlieb obtained almost the same results in different patient material, i.e., 60.0 per cent improvement, after oral administration in a series of 10 severely depressed patients, only one of whom was diagnosed as a schizophrenic (4). It has not been deemed advisable to establish therapeutic value on more than the present preliminary tentative basis because of the high toxicity of the drug which would preclude therapeutic application. The same conclusion was reached by Gottlieb (4).

The observed therapeutic activity of DMBEB cannot be explained in terms of its weak hypnotic-narcotic action because symptom alleviation (particularly in pseudoneurotic schizophrenics) occurred without appreciable such action. In view of this fact and the absence of obvious "psychic stimulation," it is apparent that the therapeutic action of the drug requires another explanation. Two hypothetical explanations are the following:

1. DMBEB really does possess "psychic stimulation" properties and in addition the hypnotic action of the ordinary barbiturates; the balance between these two actions is such that a net weak hypnosis is occasionally the resultant in man. In this case it would have to be assumed that the therapeutic action is retained despite the theoretically almost complete cancelling-out of narcotic and stimulant effects in so far as level of consciousness is concerned. In support of such a possibility is the clinical observation that in simultaneous administration of amytal and benzedrine to mental patients, considerable therapeutic activity may ensue

despite a fairly complete mutual neutralization of the narcotic and stimulant actions of the two drugs (11). In this connection it may be observed that Gottlieb interpreted the euphorizing action of DMBEB in mental depression as a consequence of its "stimulant" properties and from this concluded that amytal may exert its euphorizing action in the same condition by a stimulant rather than a narcotic action (4). Gottlieb did not report any hypnotic action of DMBEB in his series such as was observed in the present study; the difference may possibly be a function of the oral route of administration in his study as compared with the intravenous route in this report. His data could also be interpreted in terms of a narcotic rather than a stimulant action of DMBEB and the beneficial effect of amytal in depression still explained in terms of a narcotic action rather than a stimulant one.

2. The second hypothetical mechanism for the therapeutic action of DMBEB would be that the drug exerts this effect by a mechanism other than central depression or stimulation. Direct evidence for this interpretation is lacking. However, there are several sets of data which suggest that the ordinary central-depressant barbiturates exert their therapeutic action on mental symptomatology independently of their hypnotic-narcotic actions. These data are the following: (a) a few subjects display almost complete relief of symptomatology after intravenous injection of small amounts of sodium amytal before any or much intoxication is apparent in the form of drowsiness, slurred speech, or nystagmus. Conversely, a few subjects show little change in the mental status even though the central-depressant action may be carried to the point of sleep (10, 5). (b) The first effect of the barbiturates on the human electroencephalogram is the appearance of relatively rapid (20-25 sec.), medium-high voltage activity, particularly in the frontal leads (11, 1, 12). The appearance of this activity coincides temporally with reduction of anxiety and tension in some patients and the appearance of a more or less euphoric state (11, 12). The physiologic significance of this rapid activity has not been fully determined as yet but in any event it is distinct from the EEG charges which are usually accepted as manifestations of depressed consciousness, i.e., high voltage, slow activity (2).

In view of these considerations, it is possible that both DMBEB and the ordinary barbiturates owe their therapeutic effect on mental symptomatology to some hitherto undisclosed feature of their action. The pharmacologic literature contains reference to a large number of motor stimulant barbiturates which have never received clinical assay. These compounds show no underlying uniformity of chemical structure and many are in the thiobarbiturate series. The possibility exists that

therapeutic action may be obtainable with some of these drugs without the excessive toxicity of DMBEB.

Summary

The "stimulant" barbiturate, sodium 1,3-dimethylbutyl ethyl barbiturate, was administered intravenously to 20 patients with various forms of schizophrenia in a preliminary assay of its therapeutic value.

1. The drug exerted an irregularly occurring therapeutic effect (55.0 per cent) which was of most complete degree in pseudoneurotic schizophrenics. It has not been deemed advisable to establish further the therapeutic efficacy because of the relatively high toxicity which would preclude therapeutic application.

2. In accord with the literature that the drug is a convulsant in animals, 2 patients in this series had myoclonic seizures; in the remaining subjects the dosage was maintained at a subconvulsant level. A small minority of subjects showed weak signs of central nervous system depression in the form of slight drowsiness; the central-depressant action has not been reported in animals.

3. The therapeutic effect of the drug usually occurred independently of its weak and infrequent central-depressant action. No evidence was obtained that the drug acted as a "psychic stimulant" in the sense of heightening of mood and psychomotor processes.

4. Several explanations of the mechanism of the therapeutic action were offered and the desirability of further investigation of the stimulant barbiturate series indicated.

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PHANTOM LIMB SYNDROME

A Critical Review of Literature

JULIUS HOFFMAN, M.D.

Medical literature prior to the 19th century contains little relative to the phenomenon of phantom limb. Indeed, except for a brief description by Ambroise Paré in the 16th century that "amputated parts of the body may be perceived in different modifications after the amputation" (33), no significant study was made before the classical one of Weir Mitchell which was published in 1872 (31), and upon whose descriptions of the "sensory ghost" no one has as yet improved. Undoubtedly, people long before this time knew of and experienced this phenomenon, but it could only be assumed that the reasons for its not having been mentioned more fully previously were that to have done so would be tantamount to losing one's reason and/or admitting that the devil or some other supernatural forces had gained entrance into the body. This would, because of the status of medicine and society in general prior to the 19th century, leave one's self wide open to all kinds of punishments. With the advent of Mitchell's study on "Injuries of Nerves and Their Consequences" (31), the whole field of investigation of the phantom limb seemed to open up.

Phantom limb has been variously described as an illusion or hallucination, depending on whether or not one believes that a definite sensation is received and misperceived, or whether there is no sensation to begin with (16). Its occurrence after amputation is supposed to be invariably present (1, 3, 11, 25, 31, 39), except when the loss was already in existence at the time of birth (1, 34), took place before the age of three to five years (5, 34), or after a chronic disease process such as tuberculosis of the joints (16). It has been said that, "in truth, the adult subject who refused to admit the presence of a phantom limb after amputation of a major portion of it is to be considered psychologically abnormal" (5). However, phantoms of the penis, breast, or facial parts are infrequent (16). Even phantom teeth have been reported (1). Amputation is not a necessary prerequisite for the occurrence of a phantom limb, for it has occurred in many psychotic states and occasionally in neurologic conditions where there has been separation of the spinal roots, nerves, or major fibers to the extremities with total

loss of sensation (46). Thus, for example, it has been observed in cases of complete paraplegia due to vertebral fractures (6). Although the phantom can take on any size, shape, or position, it is usually described as a positive sensation of numbness or tingling which is not painful. The position of the phantom is supposed to assume that posture that was last remembered by the person before the amputation. An accidental amputation results in a longer lasting phantom than a planned one.

Phantoms of the upper extremity are usually stronger and more enduring than those of the lower (20), though sided-dominance (right vs. left) plays no significant role in the determination of a phantom appearance (5). Those parts which have the greatest cortical representation (for example, the distal digits and joints) are more persistent and lasting, to the point that, with the eventual passage of time and "telescoping," the hand may be attached to the stump without an intervening forearm or arm. The hand usually assumes a position of rest with the digits arranged as if holding a large ball. In over one half of the instances, the elbow is flexed at a right angle with the forearm semipronated across the front of the chest. The foot and toes are usually in a position of rest, and in two-thirds of the cases the knee is extended. In all cases the posture resembles that assumed by a hemiplegic extremity (20). Weather, such as cold or dampness, may cause a return or accentuation of the phantom, and its existence and/or disappearance may depend on some change in activity of cerebral centers as for example in "thinking" (20), hypnosis (16, 44), etc. However, excitation at the amputated site or locus of the phantom causes no significant changes in the electroencephalograph. Movements in a phantom are normal and require voluntary effort for their elicitation. The ability to move the parts is proportional to the intensity of the paresthesiae with it being most persistent and of greatest latitude in the thumb, index finger, and great toe. The length of the stump, method of amputation, or method of treatment of the nerves have no effect on the metamorphosis of the phantom though severe pain, sedatives, shock, and toxemia do, and this by virtue of their lowering the level of consciousness. It is of some interest to note that the pain from distant organs can be referred to a phantom extremity. One such case was noted when the cardiac pain of a coronary occlusion was referred to a phantom left arm (7). The phantom of the lower limb appears at the beginning of micturition in about 90 per cent of the cases and occasionally at defecation. Movements of the stump are associated with movements of the phantom only if the kinesthetic sensation remains in the stump (28). However, stimulation of the peripheral nerve to the amputated extremity

where the phantom is situated results in no change of its configuration or behavior. Initially, after the phantom has disappeared, fitting the stump for a prosthesis may cause the return of the phantom (24). However, after some time and acquaintance with the prosthesis, the phantom seems to disappear when it is worn but reappears when removed. Intercurrent illness may likewise reawaken the awareness of the phantom limb (24). Not infrequently a phantom can pass through such solid objects as walls, beds, or the patient's own body. However, when one part of the phantom comes in contact with another, as in a clenched hand, pain almost always results. This and other bizarre abnormal posturing most often leads to painful reactions which are described as twisting, cramping, tearing, etc. Although there is some disagreement on this observation (6), it is generally believed that it is considered to be indicative of severe psychopathology (11) or at least of psychogenic origin (5, 12, 16), and is present in approximately 7 to 10 per cent of the total amputees. It has been postulated by some workers (23) that there may be some relationship between the occurrence of a painful phantom and the patient's previous exposure to or contact with some other amputee. It should be added here that some differentiation ought to be made about the various types of postamputation pain. The supposed typical neuroma pain is localized, of a stinging nature, and is provoked by mechanical stimulation of the neuroma within the stump, and radiates into the phantom. The causalgia pain is usually of a burning nature and provoked by the slightest touch of the area and not infrequently is associated with a cold, cyanotic, sweaty, shrunken stump. For the purpose of this discussion, more detailed factors about causalgia will be omitted.

The controversy revolving about the question of the genesis of the phantom limb phenomenon has been long and bitter with much evidence for any against each side. Generally, there are those who maintain the difficulty is organic (6, 18, 25, 28, 29, 37, 40). On the other hand, there are many equally competent workers who maintain the difficulty is psychogenic in origin (1, 19, 39), and, as in many controversies, there are those who believe that both factors are operating. Some of the so-called "organisists" think the phantom originates peripherally at the cut nerve and/or neuroma (36, 37, 42). It is maintained that "end-bulb neuromas with branching masses of Schwann cells and proliferating axons imbedded in scar tissue (are) ideal for the production of pain," which evokes the idea of a phantom. "The scar tissue with its decreased circulation (causes) anoxic nerve fibers to fire off repetitive stimuli" (38, 50) in "hypersusceptable tissues" (25). This hyperirritable peripheral nerve becomes overstimulated even after apparent

removal of the exciting factor and causes the "self-reexciting internuncial neurons of the spinal gray matter (to) continue to discharge centrally and peripherally and thus produce neurophysiologic responses and clinical signs predominantly in the affected limb and the psychopathologic reactions" (28). Furthermore, "a strong peripheral stump excitation without sufficiently powerful inhibitory counterfunctions of the central nervous system results in a phantom limb by disorganizing a harmonious body scheme in its kinesthetic-tactile-optic homophonia" (40). Because one's postural status in space is mediated through the proprioceptive senses, it is felt by several investigators that the integrity of the phantom limb depends on the posterior columns (4, 5, 27, 38). The thalamus, a continuation of these pathways to the next higher level, might be the seat of the phantom limb difficulty since recognition, memory, and pain are all intimately related here (10, 18). Carrying this one step higher to the postcentral gyrus of the parietal lobe in the cerebral cortex would explain not only the proprioceptive alterations, and pain, but other higher mental functions through the numerous intermingling association pathways connecting the other centers of the brain.

"The presentation of the body to consciousness is known as the body image or schema" (3), and "the body image concept of one's self in space becomes a permanent part of the individual's perception, and it is postulated that the major part of the formation of a complete body image takes place in early childhood before the age of six with most of the perceptive awareness occurring during the first three years of life. It can be seen, then, why congenital absence of limbs or amputation during early life results in no phantom in the former instance or in a weakly represented one in the latter (34). Removal of one or more of the extremities does not seem to alter this concept, at least not immediately" (44). The pattern of body image consists of processes which construct and build up with the help of sensations and perceptions, but the emotional processes are the force and the source of energy of these constructive processes, and they direct them. One is accustomed to having a complete body. The phantom of an amputated person is, therefore, the reactivation of a given perceptive pattern by emotional forces. The great variety in patterns is only to be understood when we consider the emotional reaction of the individuals toward their own body (44). This is not to deny the "peripheral" aspects of the phantom limb since "the psychical origin" of pain may be projected into some peripheral area (45). One's position or status, so to speak, in life is in a good share dependent on his self-evaluation in and on his environment. These are mediated through the senses of which not unimportant are the tactile,

kinesthetic, and optic. The hand gives more sensations than any other part of the body (in its close relation to the outer world) while the foot gives most intimate touch with the earth. The more distal the part, the more sensitive the end-organ, and the more intimate and more important the contact between the self and his environment. As was noted above although it has been reported, it is rather unusual to find a phantom breast, penis, or facial feature. This would seem to be out of agreement with psychoanalytic or purely psychological theories for the explanation of the phantom. Since the position of the phantom is often a rigid one and that in which the patient lost his limb, it is as if the person were trying to preserve the last moment in which the whole body image was present (44). The phantom limb represents a narcissistic inability to renounce the integrity of the body or acknowledge the symbolic castration and thereby accept a relatively inferior position and/or separation from the world. However, if this were entirely so, one would expect that it should be more pronounced after amputation of the mammae, penis, or face than after the extremities. "There can be no doubt that the libidinous significance and cathexis of the face, mammae, and genitals must be greater than that of the extremities, but nevertheless there are few phantoms after the loss of these parts. It seems that the engrams of easily movable parts of the body can be more readily produced than those of less easily movable parts" (16).

In a "normal" individual a "phantom grip" on the world can be relinquished to be compensated for by some other defense mechanism. If, however, this cannot be done, severe pain sets in and this, plus bizarre-positioned phantoms, indicates severe psychopathology. This may result in a severe obsessional neurosis (21), drug addiction, and/or suicide (5, 50). It is interesting to note at this point that a "normal" person can distinguish between his subjective and objective perception, whereas in the psychotic, hallucinating patient, these become fused and the phantom becomes intimately bound up in his psychotic processes. "The final picture of a phantom is, to a great extent, dependent on the emotional factors in the life situation. The phantom is a model of how psychic life in general is going on. The interaction (between the periphery and the center) is based upon the playful multiplication of psychic experiences. After amputation the individual has to face a new situation, but since he is reluctant to do so, he tries to maintain the integrity of his body" (44). "The body and each portion has connected with it some emotional significance derived from early familial conditioning and of the later cultural values placed upon physical development. The attitudes of the mother and the father toward the body of the child leaves its indelible impression on that child as far as his later

concept of himself as a person is concerned. Pain is often intermittent and represents an emotional response (which is) an indication by the patient that he is suffering from the loss of an important part which has significance in terms of his relationship with others. In certain patients these symptoms could be induced by reference to some known cause of anxiety in the patient's interpersonal life" (23). It has also been suggested that the phantom limb represents a wish fulfilling hallucination serving the function as an isolation and denial of the loss of the parts and the possible painful emotion associated with this loss.

The approach to treatment of the painful phantom limb (painless phantom limbs requiring little or no treatment, since they are either not incapacitating or disappear spontaneously), varies with the particular investigator's attitude, especially his ideas as to the formation of the phantom and the primary site of dysfunction. With very few exceptions none of the therapeutic approaches treat the phantom limb prophylactically. Some investigators are firm in their conviction that surgery alone is all that is required, others psychotherapy, or physiotherapy, or anesthesia, but almost all agree that some combination of several of these approaches is necessary. There are those of the surgeons who emphasize the treatment of the neuroma with simple resection with or without interruption by injection block or resection of the regional sympathetic chain (25, 50). Others recommend sympathectomy with anterior rhizotomy (14), or sympathectomy with anterior and posterior rhizotomy combined (8). Still other surgeons approach the sympathetic ganglia, or the periarterial autonomic nerves (32), or the sympathetic nerve alone (29). Neurectomies (2, 31), posterior rhizotomies (14), anterior and posterior rhizotomy combined (14), intrathecal alcohol injections have been advocated but, for the most part, abandoned. Repeated stump neuroma percussion was also suggested (42) as was the injection of a 0.3 cc of 6 per cent NaCl solution into the spinous ligaments. (The rationale for this latter procedure was based on the theory of counterirritation) (26). Recently, the surgical techniques have been focusing their approach on the anterolateral chordotomy (8, 12), posterior chordotomy with (38) and without (5) incision of the substantia gelatinosa and the tract of Lissauer, postcentral gyrus of the parietal lobe (9, 18, 22), and prefrontal lobotomy, (unilateral and bilateral) (15, 22, 27, 43, 49). The last approach, of course, is aimed at "eliminating the sufferer's introspection and self-centered concentration on his condition" (32) rather than negating the perception of pain. It should also be stated that electroshock therapy has been used with some favorable results by some therapists (32, 35). One "leit motif," so to speak, running throughout most therapeutic approaches (either

in a positive or negative way, mostly the former) was the matter of psychotherapy. Most emphasis was placed on the maladjustment to the amputation and pain. In an attempt to prevent the personality from deteriorating due to suffering, introspection, and morphine addiction (50), the psychotherapy suggested takes the form of "re-education, moral encouragement, and readjustment into society (32), with a sympathetic and understanding attitude" (29). Hypnotherapy combined with psychotherapy has been advised by some psychiatrists, while others interested in the treatment aspects of this problem indicate that since the phantom limb represents a form of focusing mechanism in an obsession neurosis (1, 21), the treatment would resolve itself into that used in the therapy of any other obsessional neurosis.

As regards psychotherapy perhaps the best work to date has come from the Mayo Clinic under the leadership of Dr. L. C. Kolb. The group there maintain that "although physiologic mechanisms contribute, it seems clear that the painful complaint is a symptom which is maintained by psychic mechanisms and may be understood only by some comprehension of the individual's past experiences, in particular those that relate to the development of his attitudes toward his body. The great plasticity of this painful symptom when seen shortly after onset and its ready reduction by relatively simple and brief psychotherapeutic procedures when other measures have been ineffective support this opinion. The brief psychotherapeutic approach utilized in this department involves (1) the patient's concept of the phantom phenomenon and any attendant rationalization he may have regarding its occurrence, (2) his wishes and fears in regard to disposal of the amputated part, and (3) the significance of his present and past attitudes toward his body in his real and phantasied experiences with persons significant to him as parents, family and associates." It was also suggested that the "proper preparation of a patient who is to undergo amputation might prevent in some instances the development of the painful phantom hallucination. Such preparation could well be carried out by the surgical team and would include a discussion of the occurrence of the phantom phenomenon and a considerate inquiry as to the patient's wishes and fear in regard to the disposal of the part to be amputated." Furthermore, psychotherapy no matter what form it takes must consider two important aspects of the problem "(1) the illusion of the lost extremity and (2) the complaint of pain in the illusionary extremity. . . . (In the first case) this is done by explaining the reasons for its presence and also the tendency of the phantom to shrink and disappear, its reappearance at times of physical and emotional distress or on the application of a prosthesis. It must be broad enough to satisfy the fact that the

majority of persons with phantom limb do not complain of pain in association with the phenomenon. During the process of psychiatric interviews a careful evaluation should be made of the personality structure (if not already done preoperatively) and if the symptom represents one aspect of a neurotic foundation, then it would be quite important to undertake the treatment of the whole individual rather than the isolated phantom limb". It is further important to note that excessive use of drugs, especially narcotics, is definitely contraindicated since "the liability of the psychoneurotic patient to addiction is . . . well known."

In conclusion, then, it would seem that though there is movement in the right direction toward the proper understanding of this enigma of the phantom limb phenomenon, no completely adequate formulation of a theoretical framework or therapeutic approach which is consistently reliable, applicable, and predictable is as yet available and much work remains to be done.

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SOCIETY PROCEEDINGS

BOSTON SOCIETY OF PSYCHIATRY AND NEUROLOGY

Meeting of May 21, 1953

RAYMOND D. ADAMS, M.D., PRESIDENT, *Presiding*

STUDIES IN CARBOHYDRATE METABOLISM AND ITS REGULATION IN HEALTH AND DISEASE IN THE CENTRAL NERVOUS SYSTEM. WARREN S. MCCULLOCH, M.D.

What these studies leave to seek will be obvious if we recapitulate them in logical, rather than chronological, order. As to carbohydrate metabolism, the brain resembles muscle, including steps from pyruvate through acetyl coenzyme A to oxidative cycle, CO_2 and H_2O, catching energy in adenosine triphosphate, storing it in phosphocrea tine.

As to carbohydrate regulation, the brain has some control surviving destruction of pituitary, vagal, and sympathetic outflows. How the brain detects blood sugar level is still a mystery. Taste raises it, sham feeding lowers it. Interest in movies and games disturbs it. It is less stable in neurotics than in normals. Among these are some who, for psychologic reasons, on eating secrete too much insulin, thus converting sugar to fat causing a 30 per cent fall in oxygen uptake under otherwise basal conditions. They show so-called hypoglycemic reactions while falling blood sugar is still elevated.

In hypoxia and fits, the brain consumes many times the normal amount of glucose, is loaded with lactate and pyruvate which it subsequently oxidizes, but exhausts its phosphocreatine before the concentration of adenosine triphosphate falls. These changes are insufficient to induce remission in schizophrenia. They may be unnecessary; but only the work on hyperoxic convulsions has a chance of proving it. Though DDT and nitrogen mustards induce cerebellar fits precipitated by CO_2, they cannot be used clinically because they damage the nucleus dentatus. We seek a convulsant to hit the hypothalamic structures.

Many schizophrenics with clouded sensorium (Meduna's oneirophrenics) have elevated sugar tolerance curves, perhaps a high titer of insulin, and are resistant to insulin. The resistance can be transferred to animals by intraperitoneal injection of the patient's blood. They excrete a high molecular weight protein, hyperglycemic factor in urine, not found in normals or in other diseases save a few vascular disorders. Though the chemical change precedes clinical symptoms in remission and relapse, it is probably not their cause; for catatonia in man, relieved by intraventricular cholinesterase, shows

return toward normal insulin sensitivity; and catatonia, produced by a lesion of the brain stem in monkeys, is accompanied by insulin resistance relieved by intraventricular cholinesterase and reprecipitated by intraventricular acetylcholine. This warrants thorough clinical investigation when sufficient quantities of sufficiently pure human choliesterase become available.

BOOK NOTES AND REVIEWS

Books received are acknowledged and given a brief description in this section. Selections serving a variety of interests will be made from these for a more extensive review, as far as space will allow.

BOOK NOTES

Critchley, MacDonald. THE PARIETAL LOBES. [London: Edward Arnold & Co. and Baltimore: Williams & Wilkins Co., 1953. Pp. 480, Figs. 139 and 11 plates. $13.50.]

This scholarly contribution to neurological literature presents in detail in fourteen chapters the comparative anatomy, the functions and the various symptoms produced by lesions of the parietal lobes. The author is an internationally well-known investigator and scientific worker who has thoroughly analyzed the literature on the subject, and who has had an extensive personal experience in this particular field.

The test is a model of clarity, is well illustrated, and carries a classified bibliography of 1093 items. The book is also enhanced by photographs of E. Smith, Head, Holmes, Dejerine, Kleist, Gerstmann, Lhermitte, Pötzl, Goldstein and Von Monakow, all of whom contributed through the years to the knowledge of the parietal lobes.

The book will enrich the library of neurologists and psychiatrists and serve as a classical reference on this subject for many years.

De Rudder, B. GRUNDRISS EINER METEOROBIOLOGIE DES MENCHEN; Dritte Auflage; [Berlin: Gottingen; Heidelberg Springer, 1952. Pp. 303 with 56 illustrations. D.M. 29.80.]

This is the third newly revised edition of a valuable book on the influence of weather conditions and seasonal changes on various human functions and disorders. It brings up to date the information available in this field of observation which commanded the interest of such scientists as Hallpach in Germany and William Peterson in Chicago, who wrote volumes on the subject, many years ago.

The author describes in detail the special methods of studying meteorobiology and points out the errors that have been found in some of the current explanations of the significance of atmospheric events and conditions. Physiological effects of weather changes, the analysis of seasonal variations, disorders characteristic during winter and summer and various disease cycles are ably discussed.

The influences of meteorobiological events on acute infections, rick-

ets, tetany, metabolic disorders, season allergies, hormone system functions and on many other disorders are given due consideration. The text closes with comments on meteorobiology in medical practice and propalyxis. It offers an understanding of a much neglected aspect of the biology of man and the pathology of disease and as such could be read with profit by physicians in active practice.

Fromm, Eric. THE FORGOTTEN LANGUAGE. [New York: Rinehart & Company, Inc. 1951. Pp. 263. $2.50.]

The subtitle of this book, "An Introduction to the Understanding of Dreams, Fairy Tales, and Myths", indicates quite clearly its contents in a general way. It includes chapters entitled "The Nature of Symbolic Language", "The Nature of Dreams", "Freud and Jung", "The History of Dream Interpretation", "The Art of Dream Interpretation" and "Symbolic Language in Myth, Fairy Tale, Ritual and Novel."

Fromm always writes inspiringly and with a wide knowledge of the historical development of dynamic psychology. In his discussion of symbols which he places in three categories, vis. universal, sex and authority types, he is not cramped by the orthodox Freudian, which, however, he does not disregard entirely, but rather modifies it. The author does do some juggling with the Epidus situation and in spots seems to find heavy going, although it is refreshing to know that not every worker is so soaked with orthodox analysis that he is unable to grasp any other view point or dynamic explanation. While the book does not, on the whole, advance our knowledge very much, it is an "introduction" and may be read with profit by students in this field.

BOOK REVIEWS

Krabbe, Knud, H. STUDIES ON THE MORPHOGENESIS OF THE BRAIN IN BIRDS (Morphogenesis of the Vertebrate Brain V). [Copenhagen: Ejnar Munksgaard, 1953. Pp. 100 and 53 plates with 185 figures. d. Kr 40.]

This excellent atlas on the morphology of many species of birds is the fifth in an important anatomical series in English by the well known Danish neurologist. The first study was concerned with the morphogenesis of the brain in reptiles, the second with the lower mammals, the third with Rodentia, Prosimiae and Edentates and the fourth with Hyracoidea, Ungulata, Carnivora and Pinnipedia.

The present atlas is a model of clarity in text and illustration. The author points out that the "description of the morphogenesis of the brain in birds is of comparatively early date. It is, however, limited to a

very few species, predominantly hen embryos." . . . "the literature contains very thorough descriptions of the morphogenesis of the brain in hen, duck and lapwing partly of the brain as a whole and partly of individual sections of the brain. . . . hardly any embryological investigations have been published on all the other highly varying orders of birds."

Following a review of the literature the author presents his studies on a variety of brains obtained largely from the unique and rich collection of bird embryos at the Tornblad Institute in Lund: The variations noted in the brains of such diverse birds as ostriches, humming birds, owls and penguins are most instructive.

One must say regarding studies of this type, so beautifully illustrated and so timely in presentation, that only those who have carried out similar investigations can really comprehend the enormous amount of patient investigation and careful thought required for their completion.

The book may be highly recommended to all students interested in comparative anatomy of the nervous system whether physicians, anatomists or zoologists.

NOTES AND NEWS

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5th International Congress on Mental Health will meet at the University of Toronto, August 14-21, 1954. The theme is: MENTAL HEALTH IN PUBLIC AFFAIRS. There will be Technical Sessions each morning organized around five major topics: Areas of Partnership in Mental Health and Public Health; Mental Health in Governmental Activities; Mental Health of Children and Youth; Community Partnership in Mental Health; Professional Advances in the Mental Health Field.

In addition to the Technical Sessions there will be Round Tables designed to meet the interests of special groups of delegates on the following topics: Mental Health and Education; Parent Education; The Role of the Volunteer in Mental Health Work.

International Institute on Child Psychiatry

The Institute will meet on August 13 and 14. The theme of the Institute is: THE EMOTIONAL PROBLEMS OF CHILDREN UNDER SIX.

On Friday, August 13, small working groups will spend the entire day in discussing prepared clinical case studies. On Saturday morning, August 14, larger Group Meetings will consider research reports.

The case studies and research reports are classified in 4 major areas: Psychosis in Children; Prevention; Inter-relationship of Physical and Emotional Factors; Maternal Separation. Institute registrants will be asked to select the area in which they are most interested. In so far as possible assignment to Group and Section Meetings will be made in accordance with their choice.

On Saturday afternoon, there will be a plenary session with papers presented by Dr. Georges Heuyer, France; Dr. Emanuel Miller, U.K., Dr. Benjamin Spock, U.S.A.

Fees and Inquiries

The inclusive fee for both conferences is $25.00; $20.00 if paid before June 1st.

All fees and inquiries should be sent to the Executive Officer at the above address.

NOTICE: All editorial matter should be sent with postage to Dr. Nolan D. C. Lewis, 70 Pine St., New York 5, N. Y. Authors are requested to omit numbers from bibliographies and arrange same alphabetically.

All business communications should be addressed to THE JOURNAL OF NERVOUS AND MENTAL DISEASE, 70 Pine St., New York 5, N. Y.